1975

Effect of response set correction on attitudes used in the prediction of organizational behavior

Thomas Arthur Bubolz
Iowa State University

Follow this and additional works at: https://lib.dr.iastate.edu/rtd

Part of the Sociology Commons

Recommended Citation
https://lib.dr.iastate.edu/rtd/5406

This Dissertation is brought to you for free and open access by the Iowa State University Capstones, Theses and Dissertations at Iowa State University Digital Repository. It has been accepted for inclusion in Retrospective Theses and Dissertations by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
INFORMATION TO USERS

This material was produced from a microfilm copy of the original document. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the original submitted.

The following explanation of techniques is provided to help you understand markings or patterns which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting thru an image and duplicating adjacent pages to insure you complete continuity.

2. When an image on the film is obliterated with a large round black mark, it is an indication that the photographer suspected that the copy may have moved during exposure and thus cause a blurred image. You will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., was part of the material being photographed the photographer followed a definite method in "sectioning" the material. It is customary to begin photoing at the upper left hand corner of a large sheet and to continue photoing from left to right in equal sections with a small overlap. If necessary, sectioning is continued again — beginning below the first row and continuing on until complete.

4. The majority of users indicate that the textual content is of greatest value, however, a somewhat higher quality reproduction could be made from "photographs" if essential to the understanding of the dissertation. Silver prints of "photographs" may be ordered at additional charge by writing the Order Department, giving the catalog number, title, author and specific pages you wish reproduced.

5. PLEASE NOTE: Some pages may have indistinct print. Filmed as received.

Xerox University Microfilms
300 North Zeeb Road
Ann Arbor, Michigan 48106
BUBOLZ, Thomas Arthur, 1941-
EFFECT OF RESPONSE SET CORRECTION ON ATTITUDES USED IN THE PREDICTION OF ORGANIZATIONAL BEHAVIOR.
Iowa State University, Ph.D., 1975
Sociology, general

Xerox University Microfilms, Ann Arbor, Michigan 48106
Effect of response set correction on attitudes used in the prediction of organizational behavior

by

Thomas Arthur Bubolz

A Dissertation Submitted to the Graduate Faculty in Partial Fulfillment of The Requirements for the Degree of DOCTOR OF PHILOSOPHY

Department: Sociology and Anthropology
Major: Sociology

Approved:

Signature was redacted for privacy.

In Charge of Major Work

Signature was redacted for privacy.

For the Major Department

Signature was redacted for privacy.

For the Graduate College

Iowa State University
Ames, Iowa
1975
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER 1. INTRODUCTION</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectives</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER 2. CONCEPTUAL FRAMEWORK OF ATTITUDES AND BEHAVIOR</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptual Orientations</td>
<td>10</td>
</tr>
<tr>
<td>Performance as a function of attitudes</td>
<td>14</td>
</tr>
<tr>
<td>Motivational stimuli</td>
<td>16</td>
</tr>
<tr>
<td>Attitudes and performance</td>
<td>22</td>
</tr>
<tr>
<td>Construct Definitions</td>
<td>24</td>
</tr>
<tr>
<td>Traditionalism</td>
<td>26</td>
</tr>
<tr>
<td>Control over environmental uncertainty</td>
<td>27</td>
</tr>
<tr>
<td>Individualism</td>
<td>28</td>
</tr>
<tr>
<td>Activity</td>
<td>29</td>
</tr>
<tr>
<td>Directing, leadership, and motivation</td>
<td>30</td>
</tr>
<tr>
<td>Role performance</td>
<td>30</td>
</tr>
<tr>
<td>Role behavior</td>
<td>32</td>
</tr>
<tr>
<td>Moderator effects</td>
<td>34</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER 3. CONCEPTUAL BASES FOR MEASUREMENT</th>
<th>37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude Measurement</td>
<td>38</td>
</tr>
<tr>
<td>Response Set</td>
<td>47</td>
</tr>
<tr>
<td>Social desirability</td>
<td>50</td>
</tr>
<tr>
<td>Response acquiescence</td>
<td>51</td>
</tr>
<tr>
<td>Method artifacts</td>
<td>54</td>
</tr>
<tr>
<td>Research orientations</td>
<td>57</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER 4. EMPIRICAL APPLICATIONS</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scaling Methods and Response Biases</td>
<td>60</td>
</tr>
<tr>
<td>Techniques for Estimation</td>
<td>69</td>
</tr>
<tr>
<td>Research Questions and Hypotheses</td>
<td>81</td>
</tr>
</tbody>
</table>
CHARTER 5. METHODOLOGY 87

Scale Construction Techniques 88

Attitude clusters - uncorrected 90
Managerial performance 93
Moderator effects 95

Response Set Estimates 97

CHAPTER 6. ANALYSIS AND FINDINGS 102

Comparisons of Corrected and Uncorrected Scales 103

Additivity 103
Homogeneity of variances 109
Symmetry of covariance matrices 112
Estimates of scale reliability 115
Scale orthogonality 118
Summary of scale properties 121

Moderator Effects 123

Attitude-Behavior Relationships 126

Attitudes and role performance 130
Attitudes and role activities 138
Summary of attitude-behavior relationships 146

CHAPTER 7. SUMMARY AND IMPLICATIONS 152

Introduction 152

Research Methodology 155

Empirical Results 157

Evaluation of scale properties 157
Evaluation of attitude-behavior relationships 159

Implications 161

Further applications for response set estimates 163
| Generalizability of attitude-behavior relationships | 164 |
| REFERENCES | 166 |
| APPENDIX A: ATTITUDE | 175 |
| APPENDIX B: MANAGERIAL PERFORMANCE | 178 |
| ACKNOWLEDGEMENTS | 183 |
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Distribution characteristics of scale item statistics based on original scale of measurement</td>
<td>90</td>
</tr>
<tr>
<td>Table 2</td>
<td>Distribution characteristics of composite scale values on original scale of measurement</td>
<td>92</td>
</tr>
<tr>
<td>Table 3</td>
<td>Distribution characteristics of variables representing managerial performance</td>
<td>95</td>
</tr>
<tr>
<td>Table 4</td>
<td>Joint and marginal distributions of moderator variables: organization size and management experience</td>
<td>96</td>
</tr>
<tr>
<td>Table 5</td>
<td>Distribution characteristics of scale-specific estimates of individuals' response variability</td>
<td>98</td>
</tr>
<tr>
<td>Table 6</td>
<td>Distribution characteristics of scale item statistics based on measurement correction for response set</td>
<td>99</td>
</tr>
<tr>
<td>Table 7</td>
<td>Distribution characteristics of composite scale values based on measurement correction for response set</td>
<td>100</td>
</tr>
<tr>
<td>Table 8a</td>
<td>Characteristics of attitude scale composites based on uncorrected item scores</td>
<td>106</td>
</tr>
<tr>
<td>Table 8b</td>
<td>Characteristics of attitude scale composites based on corrected item scores</td>
<td>108</td>
</tr>
<tr>
<td>Table 9</td>
<td>Variance ratios for uncorrected and corrected attitude scale composites</td>
<td>111</td>
</tr>
<tr>
<td>Table 10</td>
<td>Chi-Square values for a test of compound symmetry on attitude scale item-covariance matrices</td>
<td>114</td>
</tr>
<tr>
<td>Table 11a</td>
<td>Correlation matrix of attitude scales based on uncorrected scale item values</td>
<td>119</td>
</tr>
<tr>
<td>Table 11b</td>
<td>Correlation matrix of attitude scales based on corrected scale item values</td>
<td>121</td>
</tr>
</tbody>
</table>
Table 12a. One-way ANOV examining overall differences in mean attitude scores among managers for all levels of the moderator variable 125

Table 12b. One-way ANOV examining differences in mean attitude scores for managers with low and high job mobility and managers in large and small firms 127

Table 13. Percentage points of Cochran's C_{max} statistic calculated on estimates of within-group variance for managerial performance variables and attitude variables for each level of the moderator variable 131

Table 14. Zero-order correlations, all attitude scales with variable role performance for total sample and all levels of moderator variable 133

Table 15. Zero-order correlations, all attitude scales with variable directing for total sample and all levels of moderator variable 140

Table 16. Zero-order correlations, all attitude scales with variable training for total sample and all levels of moderator variable 144

Table 17. Zero-order correlations, all attitude scales with variable staffing for total sample and all levels of moderator variable 146
CHAPTER 1. INTRODUCTION

The past decade has witnessed a great deal of skepticism and even cynicism toward empirical and theoretical research focused on the explication of relationships among attitudes and behavior. Deutscher (1969) suggests that the reasons for a large number of inconclusive results arising from empirical studies are due to the properties of instruments utilized to measure attitudes and the nature of the populations that have provided the subjects. He observes that the complexity of theoretical formulations of attitude-behavior linkages has led to a similar complexity in the methodology and technique of empirical research. This research has been done under conditions in which the assumptions of the measurement and substantive model have not been met. Regarding the types of inferences that have been made from various studies, Deutscher concludes that the field of attitude research has regressed rather than progressed primarily because it has attempted to test its theories in situations where the assumptions or the theories rarely have been met. A second source of criticism leveled at attitude research is that sociologists have become overly concerned with problems of construct reliability to the exclusion of concern about problems of construct validity.

An implicit assumption of Deutscher's argument regarding the ineffectiveness of measured attitudes in predicting behavior is that attitudes are conceptualized as free-floating
dispositions which must be related to behaviors in a specific context before they can be effectively used to predict such behaviors. Under optimum conditions the relationship can only be imperfect since behavior is a process in constant development, and is constantly in advance of attitudes that might be employed as guiding principles. Consequently, an emphasis on the immediacy and temporal specificity of interaction as a means for generating constantly evolving sets of potential outcomes would seem to preclude the utility of attitude as a construct.

The postulate of inherent inconsistencies between attitudes and behavior has been elaborated by Ehrlich (1969:30). He suggests that not only are single attitudes comprised of several components, but that a single attitude object may implicate several attitudes. Therefore, when a multi-dimensional construct is employed in a model which implicates fewer than the total number of dimensions, it follows that few behaviors may be predictable from knowledge of only one, or a few attitudes.

Liabilities associated with imperfect conceptualization of attitude-behavior relationships do not minimize problems posed by errors in measuring attitudes and the effect of these errors in confounding observed relationships among attitudes and behavior. For example, Ehrlich and Rinehart (1965) have demonstrated that the response format in prejudice scales
tends to overstate the degree of prejudice. This constitutes a source of bias in the instrument itself. In natural settings, the operations of observing and recording behavior are relatively unstandardized, contributing a component of observational bias. Furthermore, only some attitudes may be verbalized, but in any situation where attitudes may be expected to guide behavior, one can only predict the outcome on the basis of verbalized responses although they are only one of many components comprising attitude.

Two frequently investigated types of response biases are those which are introduced by a respondent giving an answer that is deemed socially acceptable, or by the use of unspecified intrinsic categories employed by the respondent in evaluating a response alternative. The first form of bias has been labeled "social desirability", and the latter is called "response acquiescence". These types of bias have frequently led researchers to err in making inferences about absolute levels of sentiment in a population, and in examining the relationship of attitudes to other important constructs.

A further problem of inference has been elaborated in Ehrlich's (1969) evaluation of low "hit rates" in attitude-behavior prediction studies. Measurement instruments are generally devised to determine attitudes toward a class of persons or objects. Predictions of related behaviors, however, are frequently made for a single member of that class.
Ehrlich's contention is that the low degree of prediction is a result of employing ecological correlations as being representative of attitude-behavior relationships for specific members of a class, rather than limiting inference to the class itself.

The focus on attitude-behavior relationships is with respect to some population of individuals embedded within a specific socio-cultural milieu. Inferences from empirical research are made with respect to structural, or relatively enduring patterns of attitudes and behaviors within an organized subunit of society.

A promising attempt to bridge the gap between investigations of individual differences and investigations of properties of aggregates is evidenced by recent efforts to place attitude-behavior relations within a specific context, and the use of moderator variables in explicating the relationship as has been demonstrated by Warner and DeFleur (1969).

If the focus of research is upon aggregates, then problems of measurement must also be oriented toward aggregate properties of methods. Many sources of error in measurement are treated as random effects, as errors which cancel out at aggregate levels of analysis. Among the exceptions are social desirability factors and response acquiescence. These have been observed to operate systematically within populations.
Investigations which have defined and measured these factors as independent variables (Phillips and Clancy, 1972) have found that too frequently these sources of systematic error relate as strongly to a dependent variable as the measured attitude construct. Under certain conditions, response biases may actually be used to explain an empirical relationship. A common property of these systematic biases is that their origin lies in the cultural milieu in which subject populations are located.

Another type of systematic bias which has been shown to affect measurement of attitudes is differential discriminative perception. Liu (1971) has postulated that individuals possess an "internal" scale for evaluating magnitudes of affect toward objects, and that these metrics are imposed upon measurement instruments contrary to the expectation and intent of the researcher. Consequently, when attitudes are assessed through an interactive technique such as a questionnaire with fixed point scales, it is unlikely that all respondents in the sample will employ the scale in the same way.

When a respondent utilizes intrinsic, unspecified categories that are different from that presented in the instrument, it may be said that instrument bias is present. To remove, or adjust the effect of instrument bias is to obtain an estimate of error which is systematic within an
individual, but may be essentially random across an aggregate of individuals. Initial steps in developing an estimator and a correction technique have been undertaken by Liu (1971).

Objectives

The overall objectives of this dissertation are two-fold. The first concern is with adapting and extending the methodology for assessing instrument bias to encompass methods of data collection and attitude measurement currently employed in Sociology. The second concern is with the use of moderator variables as a means of obtaining a more accurate estimate of attitude-behavior relationships.

Specific objectives of this dissertation are:

1. To assess the effectiveness of existing techniques for estimating the magnitude of response biases in measurement instruments and for controlling for the effect of such biases in attitude scale development.

2. To develop and evaluate a nonexperimental technique for estimating and controlling for the effect of instrument bias in sociological investigation.

3. To assess the correction technique with regard to its effect upon indices representing scale properties.

4. To evaluate the effect of controlling for instrument bias in estimating the strength of relationships among attitudes and behavior.

5. To determine the effect of moderator variables used to represent situational constraints on estimates of the relationship between attitudes and behavior.
The achievement of these objectives has as its primary focus the extension of concepts and techniques which are applicable to attitude measurement. While "paper-and-pencil" methods are not the only means for assessing attitudes, they are by far the most prominent. And although attitudes constitute an important and essential area of theoretical explanation, the poor performance of attitudes in prediction models suggests that a less global perspective might be profitably adopted. Thus any improvements to a widely used technique are likely to have a positive effect on the precision with which sociological constructs are represented, and the accuracy with which their relationships are estimated.

The principle axis method of factor analysis is used in the initial stages of the analysis to assist in allocating indicators to concepts representing attitudes toward management behaviors. A randomized block analysis of variance design is employed to assess the effect of the response-bias correction on selected indicators of scale properties. Multiple regression techniques are employed for two purposes, first to remove the effects of individual differences, and secondly to comparatively evaluate the predictive power of attitude composites before, and after correction for instrument bias.

A study by Warren et al. (1973) will serve as the framework for the investigation. The sample consists of 153
managers of agricultural cooperatives. They will be treated as the main unit of analysis. Composites developed in prior research will constitute indices which reflect the behavioral counterpart of attitude constructs developed in this dissertation.
CHAPTER 2. CONCEPTUAL FRAMEWORK OF ATTITUDES AND BEHAVIOR

Argyris' (1972) critique of general characteristics of bureaucratic organizations focuses on what he contends is an implicit and fallacious assumption of the model. The key issue in question is an assumption of immanent rationality in bureaucratic decision making which, when actually observed, appears to be confounded by irrational elements of human behavior. Resulting patterns of organization are conceived as an adaptation to and a consequence of nonrational behavior of organizational members. In taking exception to this position Argyris (1972) contends that the formal organization is the implementation of a cognitive strategy of how decision makers and others think their roles ought to be played. Consequently, studies of relationships among organizational characteristics such as the degree of specialization, impersonality of member contact, the degree of subunit stratification, and member participation in decision making requires that emphasis be placed upon the perception of these phenomena by organizational participants. Perception and action are, to some extent, conditioned by personal attitudes, and norms of the organizational milieu. This chapter will focus on the role of these norms and attitudes in structuring patterns of behavior in an organizational environment.
Conceptual Orientations

Specification of the nature of relationships among attitudes and behavior in formal organizations has been a point of contention in literature which reflects the human relations point of view. A basic model, or framework which has been employed as a guide for investigations has been summarized by Schneider and Bartlett (1968). The perspective accommodates three interdependent sets of concepts; those which focus primarily on properties of the organization, social psychological characteristics of interpersonal interaction, and indicators of role performance. Within this framework, organizational properties are treated as moderator effects which impose constraints on operation of attitudes and the range of potential behavior, but do not enter directly into relationships with either one.

Interaction in organizations is conceptualized as a relationship between the individual and the elements of his situation. A situation may refer to group properties, physical or mental resources, and organizational rules and regulations. Performance is a complex outcome determined by individual abilities channeled through the structure of the organization, and is also viewed as a result of manipulating role expectations.

Typically, only a subset of these properties is examined in a given study. Interpersonal interaction patterns for
example, have been investigated by Dubin and Spray (1964), and Martin (1959) to determine whether the position of organizational members in an organizational hierarchy had an effect on the ratio of superior to subordinate contact, peer contact, and inter-organizational communication.

Porter and Lawler (1965) have given an extensive review of literature pertaining to relationships among attitudes and behavior when constrained by characteristics of organizational structure. They have developed a taxonomy which divides organizational characteristics into two general categories. The first class refers to those characteristics which may be observed separately in many distinct subunits within the organization. The second class represents structural components of the total organization. Characteristics of sub-units include (1) span of control, (2) line-staff ratios, and (3) relative subunit sizes. Structural components representing the total organization may include variables such as (1) the number of levels in the organizational hierarchy, (2) the degree of centralization, and (3) total organization size. They have observed moderately strong relationships among attitudes and task performance under differing structural conditions.

Evidence suggests that attitudes which reflect job satisfaction are more closely related to the position of the organizational participant in the organizational hierarchy,
than are attitudes reflecting need importance. Sources of job satisfaction are more likely to depend upon environmental factors, whereas sources of need satisfaction tend to lie in personal factors unrelated to a particular occupation or organizational climate.

The most salient aspects of Lawler and Porter's (1965) research suggest that attitudes and job performance tend to be fairly homogeneous within levels of organizational hierarchy. Major changes have been seen to occur between levels and among functional roles. These differences in degree are conditional upon structure of the organization. A further result is the finding that not all types of sentiment can be expected to be present in all classes of organizational structure. For example, attitudes relevant to supervisory personnel may have little or no relevance in other occupational classifications.

Behavioral factors have been shown to be less clearly related to organizational structure than attitudinal variables. In part, this may be due to a lack of theoretical cohesiveness in research oriented toward the use of behavioral indices. The problems of conceptualization and measurement are formidable as the "unit" of behavior which may be appropriate for a time-motion study tends to become trivial when employed in the analysis of decision making behavior. It appears that there is a lack of common denominators for developing behavioral indicators which are subject to simple aggregation to
accomodate not only quantitative differences, but qualitative differences as well. Such inconsistent patterns of relationships among attitudes and behavior have been observed by Blankenship and Miles (1968) in their research of behaviors involved in managerial decision making, and in Indik's (1963, 1965) studies of the effect of organizational size on attitudes and behavior.

Furthermore, much research in the past decade, focusing on behaviors which are subject to constraints imposed by organization structure, has concerned itself with designing tasks to fit worker expectations, and determining the effect of employee morale on productivity. For occupational classifications in which personnel supervision was a major component, the focus of research was on relationships among supervisory practices and productivity, and the stimulus of monetary reward as a production incentive and source of job satisfaction. Variables such as the size of organizational subunit have been introduced as being typical of factors contributing to "organizational climate". The interest of these researchers has been in changes of attitudes and behavior in response to changes in working conditions. Studies in which these relationships have been investigated include Talacchi (1960), Fullan (1970), Brayfield and Crockett (1955), Indik (1965), and Indik (1963).
Performance as a function of attitudes

In specifying the relationship of attitudes to organizational climate and task performance, attitudes have been treated predominantly as a dependent variable. Attitudes have been placed in a causal sequence in which they have been assumed to originate as the result of an individual's assessment of his position in a network of role relationships within an organization. Attitudes reflecting job satisfaction have been expressed as a function of increases or decreases in the effectiveness or efficiency with which tasks are performed. Performance in turn, depends upon intra-group relationships, and the structural characteristics of the organizational sub-unit in which activity occurs.

Lawler and Porter (1967) have noted that much of the literature on attitude-behavior relationships written prior to nineteen fifty-five has dealt with attitudes predicated on liking or disliking the immediate work situation. Attitudes have been implicated in the relationship of worker morale to negative indicators such as absenteeism. A major contribution of Lawler and Porter (1967) has been in reversing the order in which attitudes appear in the causal sequence. An additional class of hypotheses is generated by the assumption that attitudes brought to a situation will in part determine the degree of liking or disliking of that situation, and consequently, the mode of behavior toward the tasks required in
a given role.

This reconceptualization has provided the framework for recent studies (Porter and Lawler, 1968; Blankenship and Miles, 1968; Lawler, 1966; Ghiselli, 1968; and Berlew and Hall, 1966) oriented toward organizational participation in managerial occupations. The focus of their research is on the degree of "fit" between role demands imposed by the organization, and strains induced by individual ego involvement and self wants.

In contrast to the human relations' emphasis on motivational factors such as need for self esteem, the classical point of view as presented by Tausky (1970:Ch. VI) stress work group norms, interpersonal attachments, and organizational norms as guiding principles in determining what classes of behaviors are appropriate, and in providing bounds within which innovative behavior is permissible (Georgopolos, 1965).

Complementary components of these perspectives, synthesized by Lichtman and Hunt (1971) define the features of what they call modern organization theory. Their paradigm specifies that three classes of conditions are necessary for apprehending and understanding human behavior in organizational settings. The three classes encompass (1) the organizational objectives and functional apparatus necessary for their undertaking, (2) characteristics of organizational members, their skills, needs, and external affiliations, and (3) the
structure of the task environment, the point at which task requirements and task motivation must be congruent for effective role performance.

Motivational stimuli

The treatment of attitudes as motivating factors has been a keynote of research dealing with lower echelon employees such as production workers, and first line supervisors. The use of wages or salary as a motivational stimulus has certain deficiencies. The most important is that it represents a fixed level of potential reward, and thus cannot vary directly with incremental changes in task performance. Among non-managerial personnel, attitudes represent an indicator which may be capable of differentiating high achievers from low achievers when objective or material rewards are in effect held constant.

Managerial personnel operate under a radically different set of organizational conditions. These must be taken into account when material rewards are considered as motivating factors in inducing higher levels of performance and effectiveness. Monetary reward is typically highly variable among managerial personnel within an organization, as well as between different organizations having similar structural characteristics. Furthermore, salary has traditionally been one measure of managerial worth; managers having demonstrated high levels of performance typically command the highest salaries.
In an attempt to determine the major factors contributing to managerial motivation Ghiselli (1968) compared the stimuli represented by job security, financial reward, power over others, and the perceived opportunity for self-actualization. Job security was found to have no relation to high levels of effort expended in corporate duties. A perceived need for power, as a motivating factor, was dependent upon the particular organizational climate of a given firm, and thus was not generalizable as a factor. Power was perceived as most important in highly authoritarian organizations, and less so in firms which were organized on more democratic principles. Self-actualization appeared to be important only in organizational environments in which creativity was highly valued. High financial reward was viewed as an index of successful performance. That is, it was perceived to be a result rather than a cause of effort expended in managerial duties.

While personal attributes, attitudes, and situation are frequently employed as explanations for managerial or organizational performance, their use as explicit predictor variables is infrequent in sociological research on organizational behavior. The shortcomings of this omission have been cogently stated by Argyris (1972). He notes that individuals and social systems are independent of each other only in trivial ways. Consequently, conceptual compartmentalizations are frequently arbitrary, and often misleading. When interpersonal factors...
are used as explanatory variables, frequently they have not been operationalized, and do not constitute a valid frame of reference with respect to particular investigations of organizational performance. The validity of explanation in terms of interpersonal factors depends entirely upon the rigor of formalization in an encompassing theory of motivation and behavior.

In responding to the frequently used argument that organizational phenomena must be explained at the organizational unit rather than the individual level of analysis, Argyris (1972) suggests two difficulties of applying this logic. First, while individuals typically assume organizational roles which exclude many of their attributes as persons, the necessary degree of psychological withdrawal is rarely attained. Interpersonal and intra-personal processes may have a marked effect on performance in an organizational environment, but these processes are rarely accounted for in the research enterprise. The second difficulty with this logic stems from the inability of most persons to compartmentalize their psychological orientations. The lack of this facility may stimulate change in organizationally situated behavior beyond that which might be expected from an analysis of role requirements.

With the lack of a clear-cut objective basis for determining performance motivation, the role of subjective factors,
such as perceived norms and goals and attitudes toward a variety of managerial responsibilities, takes on increasing importance. A key characteristic of the managerial role is seen in its relationship to other roles in an organizational subunit. A manager role has as its focal point operational decision-making, and in some instances, the formulation of operational policy designed to structure relationships among the organizational subunits and elements of the organization's environment to achieve organizational goals.

Defining the scope of a managerial role is open to a great amount individual initiative on the part of a role-incumbent in establishing goals and procedures. The choice of management objectives is constrained only by survival requisites of the organization, and the ability to motivate subordinates in the performance of their roles. In other words, for a given class of objectives, there are many methods by which they may be achieved. Other roles in the organization, and especially the roles associated with a highly specialized production process, depend primarily upon technological expertise of the role incumbent and the ability to apply or exercise these abilities in yielding tangible results associated with task performance. In contrast, the role of manager is multi-functional. Its primary emphasis may be placed in one or many performance areas.
The means by which the managerial functions are executed thus depends upon the personal initiative of a manager, his approach or avoidance of a course of action, and motivation to specify and expend sufficient effort required for the achievement of an operational goal.

As a case in point, Himes (1967:42) has noted that in an agricultural cooperative, full responsibility for operational management is normally assumed by the general manager. The manager has direct influence on the type and level of organizational inputs such as composition of assets, market orientation, labor composition, structure of training programs, and similar characteristics associated with organization structure and process.

Previous investigations of cooperatives also indicate that their size is rather small, the modal value being in the range of ten to sixteen employees. The structure of organizations of this size may be less differentiated than that found in larger cooperatives and other industries. A lower degree of differentiation may tend to concentrate control in a relatively few number of decision makers, assuming the organization is self-contained, and that it is committed to the full range of firm functions. This increases the likelihood that the organization will come to bear a characteristic imprint of key personnel.
Viewed from the perspective of the classical bureaucratic model (Blau, 1956; Thompson, 1967), individual biases expressed as attitudes, are assumed to contribute an insignificant degree of input into managerial decision-making processes provided that organizationally-rational criteria are available. The application of nonrational standards as a basis for initiating and evaluating programs and policies is assumed to be a perogative few managers can afford when the yardstick by which performance is evaluated depends at least in part on an organization's profitability, or its share of the market.

There have been instances, however, where nonrational considerations have played a significant role in establishing policies and operational procedures. For example, rules of conduct pertaining to attire, conversation, and behavior within the scope of the organizational environment of IBM, and similar regulations recently in effect in a large governmental organization have had no basis for their existence other than the personal attitudes of the organization's key decision-maker. As indicated previously, it is considered that the imposition of personal attitudes as an adjunct to rational criteria for evaluating the utility of decisions is even more likely in small firms which are less encumbered with formal guidelines for role performance.
Attitudes and performance

Among others, Farmer and Richman (1966) and Phillips (1962) have discussed characteristics of key functions of management. The functions: planning, coordinating, controlling, directing, organizing, and staffing are common to a wide range of business organizations, although the relative emphasis placed upon them depends upon the context of a specific firm.

Management, within the context of the local retail business, is perceived as a role which involves multiple activities. These activities may involve decision-making, formulation of operational policy, administrating, supervising, motivating, and directing. A major emphasis given to the managerial role is the allocation of resources among competing alternatives and coordination of subordinates' activities. Allocation of resources and coordination of activities requires that a manager's role activities be applied to many management functions. If allocation and coordination is said to be effective such that some outcome is maximized or minimized, then performance in a managerial role can also be said to be effective. In setting the stage for effective performance, both organizational structure and
managerial behavior contribute distinct, but interdependent components of organizational outcomes.

Etzioni's (1961) model, as it has been formulated and tested by Warren, Mulford, and Yetley (1973) illustrates the interdependency of behavioral and normative components as motivators of role performance. Their results indicate that variables such as socialization, communication, and selectivity must be incorporated as concomitants of a training program if role-performance is to be maximally effective. If, through lack of communication and inadequate socialization, an organization member is not motivated to comprehend the formal expectations of his role, then the structure of the organization will operate as an unpredictable constraint upon an individual's performance. Warren et al. (1973:5) observe that regardless of the participants' initial commitment to the organization, two processes, socialization and communication, may be employed to enhance the degree of commitment, and thereby increase the effectiveness of members' role performance.

One aspect of the analysis being undertaken will be to determine the degree to which attitudes toward managerial functions concerning performance motivation affect a manager's allocation of resources to these functions. The initiation of programs, and activities constitute behaviors which are directly linked to attitudes concerning the utility and appropriateness of these factors in enhancing organizational
Two constraints must be imposed when specifying attitude constructs which are likely to be related to activities associated with managerial functions. A first limitation is that the situation be bounded. The attitude in question must be oriented toward objects which are likely to be encountered only under certain conditions. That is, the attitude must have situational relevance. Secondly, the attitude object should reflect a principle or idea rather than a real, tangible object. Attitudes must be capable of providing guidelines for behavior when objective criteria are lacking or when they are insufficient as a basis for decision.

Attitude constructs which fulfill these criteria are similar to those employed by Himes (1967) in estimating the strength of relationships among indicators of attitude and managerial performance. Where Himes (1967) study incorporated attitudes that were ideologically oriented, and not situationally specific, the focus of this dissertation will be toward a more restricted set of attitudes both in terms of the attitude object, and the situation in which it is most likely to serve as a guide to behavior.

Construct Definitions

The specification of indicators used to represent attitudinal constructs in this study will depend upon prior
research in this area. As a starting point in developing the scales, a battery of items similar to those used by Himes (1967) has been employed. The variety of content in the two batteries of items are similar, and should lead to similar inferences about the potential range of attitudes represented by these item pools.

Himes' (1967) study ultimately employed eight attitude scales as predictor variables in the investigation of attitude-behavior relationships in formal organizations. Among the attitude constructs employed in this study were measures of orientations toward profit-making, individualism, role autonomy, rational versus expressive role behaviors, progressivism, risk preference, and traditional management principles.

Indicators which were used to represent these concepts will be employed as the basis for developing similar scales whose content is more closely represented in the context of business management. The revised constructs will be used to test the utility of the response set correction method developed previously. A result of this approach is that continuity with prior research is preserved. Methodological developments may be comparatively evaluated using similar data and models.

Five content areas which showed suitability for the development of attitude constructs pertaining to business management have been defined. These constructs represent
(1) orientations toward traditional management principles, (2) an individualistic rather than group-oriented decision-making structure, (3) a willingness to modify organizational policies in the face of environmental uncertainty, (4) a preference for physical rather than mental activity in problem solving situations, and (5) orientations toward the utility and effectiveness of employee motivation and direction. These constructs parallel, but do not duplicate those developed by Himes (1967). The theoretical basis for their effect as motivators of behavior, however, remains the same.

In defining the constructs two distinct, but complementary issues must be dealt with simultaneously; those which are primarily methodological, and those which are primarily substantive in nature. In order to make the methodological argument viable, sound content areas are required if inferences about the utility of response set correction are to be non-trivial. Substantive issues require that the definition of attitude constructs fit the situation and types of behaviors which will be affected. Definitions of these constructs are given below.

**Traditionalism**

Traditional attitudes toward business management are reflected by a highly pragmatic and utilitarian orientation of the manager in formulating organizational policies and procedures. The criterion against which they are evaluated is
the traditional profit-and-loss statement. Managers holding these orientations place highest priority on the profitability of operations, and the competitive position of the business.

Content of items selected to represent this particular attitudinal construct is reflected in statements such as; traditional ways are best, managers should continue traditional practices because new ideas are not suited to business, establish a pattern and stick with it, make decisions using past experience as a guide, and a manager should see how a new idea works for others before trying it himself. The overall orientation is one of dependence upon past events and tried and proven methods as guides to problem-solving activities. The scale associated with this construct is labeled "Traditionalism".

Control over environmental uncertainty

Positive sentiment toward corporate practices such as hedging against the potential effect of market changes reflect the perceived ability of management to reduce, or at least come to terms with, environmental uncertainty. A degree of optimism implies that the decision-maker will attempt to exert some control over situations and events external to the organization. A negativistic orientation is characterized by a fatalistic outlook in which management can only expect to minimize its losses. This construct reflects an orientation which may promote or inhibit establishment of policies and
procedures whose primary concern is organizational survival.

The content of indicators which have been used to represent this construct includes key phrases such as; slack seasons in product handling can be overcome by good planning, a good manager has no difficulty in overcoming stiff competition, a good manager can overcome marketing problems, and losses in the market may be hedged against. Positive endorsements are indicative of management confidence in being able to plan ahead, and organize and direct operations to take advantage of constraints imposed by the organization's environment. The scale associated with this construct is labeled "Control".

**Individualism**

A strong individualistic orientation implies a preference for a high degree of autonomy in making business decisions, and a manager's desire to rely on his own experience and judgment, rather than that of subordinates or committees. These persons are characterized by a high degree of inner-directedness, and self-motivation.

Key phrases of items associated with this concept include; the greatest reward of a manager is in making his own decisions, an individual should go it alone in making decisions, and an individual should solve problems by himself. In subsequent references, this construct has been labeled "Individualism".
Sentiments toward physical activity predispose a manager to seek labor intensive rather than capital intensive solutions to organizational problems. When under pressure of deadlines, for example, a manager may undertake production tasks himself rather than delegating responsibility to subordinates.

This construct differs from traditional orientations in that the latter attitudes may lead to a critical evaluation of new approaches for solving organizational problems in terms of their potential benefits. Strong sentiments toward solving problems by "working them out" implies consistent rejection of new ideas without regard to potential benefits. An activity orientation confronts a problem head-on rather than seeking to work around it. Activity for its own sake is as important as the productivity of such activity.

Items which represent this construct include phrases such as: a manager's most important asset is a strong back, managers spend too much time thinking rather than doing, assisting in day-to-day operations is more important than finding out new ideas, reading, thinking, and planning are not really important, and managers shouldn't waste time trying to find easier solutions. This construct will subsequently be referred to as "Activity".
Directing, leadership, and motivation

Attitudes toward leadership and motivation essentially reflect the degree to which a human-relations point of view is employed by a manager in dealing with employees. Managers holding positive sentiments will place greater emphasis on communication and job satisfaction. Greater emphasis will be given to interpersonal contact at the expense of formal directives.

Content of items associated with this construct is reflected in statements such as; workers don't care if the job is interesting, under the right conditions workers will seek and accept responsibility, and a manager can get farther by talking and cooperating with people. The scale associated with this construct has been labeled "Directing".

Role performance

The literature on industrial management provides the basis for concepts defining managerial performance. There is substantial agreement that components of a managerial role include functions such as training, directing, staffing, planning, organizing, and controlling. The exercise of these functions constitute the means by which management structures and controls ongoing activities of an organization. Detailed characteristics of these functions, and their relationship to firm activities have been given by Phillips (1962) and Farmer and Richman (1966).
The nature of policies and operating procedures associated with the management functions will constitute the basis for defining managerial role performance. The adequacy of performance has been determined by a panel of judges familiar with the operation of agricultural cooperatives. The type of standard employed in evaluating activities associated with these functions was the economic utility of such activities for the organization.

Components of performance which were scaled included the following policies and procedures considered to be desirable for organizations of this type. They are: (1) planning for change, (2) use of field representatives, (3) use of specialized personnel in a decision-making capacity, (4) criteria used to select wholesale sources, (5) methods of protecting the firm against market price changes, (6) adequacy of record-keeping, (7) criteria for organizing operations, and (8) use of forecasting.

Each manager was scored on the adequacy of activities in each of the eight components. These variables were standardized and summed to form a composite index of overall role performance. Larger values of the index score are associated with more satisfactory levels of role performance. This index will be referred to as "Role Performance".
Role behavior

Where role performance treats managerial activities in an evaluative frame of reference, constructs associated with role behavior consider relative amounts of activity associated with management functions. The issue is not whether some behaviors are more appropriate than others, but whether certain behaviors are engaged in more frequently than others. The measure of role performance is qualitative: the measure of role behavior is quantitative.

Three management functions, Staffing, Training, and Directing have readily identifiable activities associated with them. The measure of behavior in these functions is an estimate of the amount of time spent in these activities.

Staffing is primarily concerned with personnel recruitment, evaluation of employee performance, and determining appropriate policies for compensation and promotion. The relationship of this function to the organization as a whole is that of ensuring that personnel possess requisite skills, or the potential for acquiring these skills.

The Training function focuses on orienting employees to the task-related and normative aspects of their roles. Activities associated with this function require some interpersonal interaction with nonmanagement personnel. Indirect communication is reflected in on-the-job training sessions and seminars held outside the organization. A major component of
training involves communication of technical knowledge. A minor part is given to communication involving operating and procedural information.

Such activities are imperative if the production and other firm functions are to keep abreast of technical and procedural changes. Training, as a function, is important in developing, and maintaining resources so that they may operate with maximum efficiency.

Effective performance of organization personnel depends, in part, upon an adequate supply of supervision, leadership, and motivation. Activities associated with the directing function complement other incentives and inducements available to management. One goal of such communicative activity is to reenforce employee identification with the organization. A desirable result of reenforcement is that organizational goals come to be identified with personal goals.

A characteristic of activities associated with directing is that they involve a great deal of interpersonal interaction which is both instrumental and expressive. An important result of directing activity, for the organization as a whole, is in expanding the scope of employee role obligations beyond the confines of formal job descriptions. In subsequent references to role behaviors, these functions will be identified as "Staffing", "Training", and "Directing".
Moderator effects

Moderator effects used in this study will be developed using assumptions and procedures given by Hay (1973), Glock (1967), Lazarsfeld (1955), and others. The most important effect of incorporating moderator variables in a model is their potential for magnifying, or attenuating relationships among other variables, and without entering into relationships with antecedent or predictor variables. For example, the degree of association between variables X and Y may be statistically insignificant. When variable Z is specified in the model as a moderator effect, the association between Y and X may emerge as strongly negative or positive. A further consequence of the effect of moderator variable Z is that the degree of association between itself and variable X is expected to be insignificant.

Potential candidates for moderator variables include measures of the size of the firm and the history of job mobility of the organization's current management. Prior research has indicated that in organizations such as agricultural cooperatives, partitioning the firms by size into two categories may yield maximally distinct organization types. Firms with more than ten employees should show significant differences in measures of association among variables which depend upon the presence of a fairly elaborate organizational structure. These may then be compared to firms with fewer
than eleven employees which tend to have less elaborate structure, and may be operated quite informally.

Case studies by Hage and Aiken (1970) also indicate that a manager's background has an important influence on the way in which they organize their roles. The most important facet of background is prior experience in a managerial role in firms other than the one in which the manager is currently employed. Breadth of managerial experience implies possession of a repertory of decision making alternatives that may differ in type as well as in degree when compared to policies and procedures that have been traditional in a given organization. A result of varied experience is that it may enable a manager to introduce new ideas and procedures in the performance of management functions which supplant traditional role prescriptions in a given firm. This accomplishment may be associated with strong beliefs in the efficacy of such procedures.

Organization size has been operationalized as a measure of the number of full-time employees associated with a firm. Two classes are defined: those firms having fewer than eleven employees are classified as small, while firms with eleven or more employees are classified as large. Classification in this study is dependent upon the type of industry being studied.

Prior experience is measured by determining whether a manager has held previous managerial positions in other firms.
Managers who have held at least one management position outside their present organization are classified as movers. Managers whose only experience has been gained in the position they presently occupy are classified as nonmovers.
CHAPTER 3. CONCEPTUAL BASES FOR MEASUREMENT

The conceptual orientations which are used to develop attitude constructs implicate a class of measurement models. That is, each dimension of an attitude, as it is defined theoretically, may depend upon a certain class of measurement techniques as a basis for quantification. The class of techniques may be linked to the theoretical formulation explicitly, as in an operational definition, or it may be selected as a matter of convenience and popularity of usage. Consequently, a technique which shows great utility for the measurement of one attitudinal dimension may be highly inappropriate for another dimension.

This chapter will be addressed to the cognitive dimension of attitudes and to a dominant measurement method for eliciting responses on this dimension. The method is one in which verbalized responses are transcribed by a respondent onto a numerical continuum. The most commonly used technique which embodies this method is the Likert or Summated Ratings scale. The major concerns of this chapter will be with specifying sources of bias that may be introduced into estimates of the strength of attitudes and methods by which the degree of bias may be taken into account.
Attitude Measurement

As a discipline, Sociology has long utilized the concept of attitude as a means by which individuals perceive, evaluate, and prepare to act toward objects in their social milieu. Attitudes have on various occasions been used to refer to beliefs, values, and other relatively enduring sentiments which evolve from an individual's socialization process. Thus, attitudes provide a partial basis for categorizing aspects of one's environment. This categorization is an information reduction technique which, for an individual, yields a highly predictable evaluation of an object in question.

Two general classes of measurement approaches to attitude assessment have been used. One class utilizes verbal responses, while the other employs nonverbal criteria for assessing attitudes. By far the most widely used technique for assessing self-reported verbalized responses is the paper and pencil method. This technique transcribes verbalized sentiments into a set of standardized categories which are taken to indicate a greater or lesser amount of sentiment.

Measurement scales using the paper and pencil techniques of attitude measurement have many variations. Many of these measurement scales employ the Likert Summated Ratings scale or some variation of it. Recent extensions of the basic model have been made by Wolins and Mackinney (1965), Warren et al.
(1969), and Warland and Sample (1973). This extended technique includes a judgment-certainty dimension, in addition to the usual sentiment-magnitude dimension of the basic Likert type scales.

Measurement techniques which utilize nonverbal response behavior have more restricted applicability since capturing a response requires more elaborate equipment and administration procedures. Among these techniques are measures of galvanic skin response, eye pupil dilation, and pulse rate. Almost all nonverbal response behaviors are of a physiological nature. A comprehensive review of application and results of nonverbal measures is given in Mueller (1970), and Vidulich and Krevanick (1966).

The measurement technique which is chosen to represent attitude is to some extent dependent upon the way in which attitude is conceptualized. Summers (1970) indicates that there appears to be substantial agreement on the basic dimensions of attitude. These dimensions have been labeled: (1) cognitive, (2) evaluative, (3) emotive, and (4) action tendency.

The cognitive dimension has frequently been used as a component of belief, a fairly static construct. The evaluative dimension, generally considered to be the most important aspect of attitude, determines the degree of desirability or undesirability associated with an attitude object. The emotive dimension is related to the cognitive and refers to the way in which an individual feels about an attitude, apart from
normative prescriptions of his social milieu. The conceptual distinction between belief about an object, as opposed to beliefs about attitudes toward an object, is important if sociological explanation is to avoid the pitfall of cultural determinacy.

The action tendency dimension, or motivational factor of attitude implies that an individual will tend to identify the experience and evidence upon which his attitudes are based, with those presented in the situation at hand. Similar situations are likely to evoke similar responses to those which were instrumental in creating or structuring the attitude. The process of attitude generalization on the basis of similarity of objects has been explored by Peak's (1973) investigation of attitude change.

Regardless of the rather fine distinctions that have been drawn about the different dimensions of attitude, one fact remains; the components must be inferred from what are essentially self-descriptions of potential behavior, or sentiment toward an object, or class of objects. A simplified working definition of attitude has been provided by Bem (1968). His definition states that an attitude is an individual's self-description of his affinities for, and aversions to, some identifiable aspect of his environment.

It has long been recognized that, among the various approaches used in assessing attitudes, verbal statements are taken to be indicators of "real" attitudes. Bem (1968:198)
observes that while investigators sometimes employ physiological measures, disguised or indirect indices, and even behavioral observations in attitude research, these are typically treated as supplementary variables. Their relationships to "real" attitudes, that is subjects' self-descriptions, are considered to be a valid object of empirical investigation.

A liability of self-descriptive, verbalized attitude measures is that one can never be certain that the response behavior elicited from the subject, rather than reflecting "real" attitudes, may be a consequence of verbal fluency, normative prescriptions for the appropriateness of a response, a desire to please the investigator, or a lack of saliency of the attitudes being investigated. Consequently there are many competing alternative interpretations that must be considered when analyzing self-descriptions. Additional sources of response confounding may be due to the testing situation, investigator, cultural norms, answering on the basis of knowledge rather than sentiment, and the inability to accurately transcribe a verbal response into a standardized category.

Numerous investigators (Cronbach, 1950; Edwards, 1957; Westie, 1953; DeFleur and Westie, 1958; Phillips and Clancy, 1972; and Carr, 1971) in Sociology and Psychology have recognized and investigated some of the confounding effects that may be generated when verbal responses are elicited.
These varieties of response contamination are generally grouped into categories whose labels indicate the type of bias which may arise from the measurement process.

One of the most ubiquitous classes of unwanted influence has been labeled the social desirability factor. The confounding influence of social desirability is thought to occur when the respondent reacts to the expectations of the investigator, either in an attempt to please the other, or to present himself in a favorable perspective. This factor is especially important when the respondent anticipates that his responses will be utilized in subsequent evaluation of other performances. Explanation of how social desirability operates has been phrased in terms of ego-involvement, conformity to internalized norms, or reference group standards.

A second major category of response contamination has been called response acquiescence. Cook and Selltiz (1970) observe that it has long been known that some individuals have a consistent tendency to agree or disagree with items presented them regardless of the item content. A recent investigation of acquiescent bias inherent in Anomie scales has been done by Carr (1971).

The purpose of Carr's study was to show that the Srole "anomie" items are, in part, a measure of acquiescence when they are administered to respondents who are socially subordinate in both race and class characteristics. The Srole
items were presented in their original form and in obverse form in alternate successive interviews. Acquiescence was measured by the frequency of agreement with scale items expressed by the interviewee. Both groups of respondents were found to have scale scores which were not significantly different, although one group had been administered positive items, while the other group had responded to the obverse of the original items.

After controlling for the possible influence of interviewer bias, the data indicate that the acquiescence factor explains approximately 62 percent and 42 percent of the variance in scale items, where tests were administered by white and black interviewers respectively. His findings suggest that such well known and widely used instruments such as the Srole Anomie scale may elicit considerable amounts of acquiescence bias.

Response bias inherent in many paper and pencil measurement techniques may also provide a considerable source of unsystematic, nonreliable variation in scale scores. The effect will be an attenuation of correlation coefficients used in testing for internal consistency, and external validity. Furthermore, many of the currently used statistical models are not as robust against specification error as were tests employed in previous decades.
The use of "nonparametric" or "distribution-free" statistical tests does not require the researcher to make assumptions about the distribution characteristics of the response variables. The only requirement is that the test statistic approximate a known distribution. Statistical tests associated with the variety of "least-squares" estimates such as regression and correlation coefficients requires that the residuals be distributed NID(0, \(\sigma^2\)). The assumption of normality and homogeneity is rarely met when the residuals contain systematic, but unspecified sources of variation. By excluding a strong factor such as acquiescence from a model, the findings may be invalidated.

Much current research in Sociology and related disciplines employs large samples, and multi-purpose schedules designed to tap many dimensions of respondents. The dimensions may reflect respondent personality, group affiliations, role performance, or measures of self-concept. In addition, there is increasing emphasis being placed on standardization of instruments in order to enhance the possibility of replication of studies. Many investigations also depend upon a secondary analysis of data collected under conditions about which an investigator has limited information. Consequently, the use of experimental controls to reduce effects of response biases is precluded.

The effects of the various types of response bias are again being given consideration in Sociology after a two-decade
period in which the problem was ignored, or assumed inconsequential. Earlier studies are being reviewed and replicated (Carr, 1971; Phillips and Clancy, 1970), and new investigations have been undertaken (Jackman, 1973) to determine the situational and structural conditions under which response biases are most likely to occur. The results of these investigations indicate that response bias may have seriously compromised inferences based on some well-known constructs. Perhaps a more important consequence is that external validity attributed to relationships among constructs, measured by personality and social structural variables, has been called into question.

The Multitrait-Multimethod technique (Campbell and Fiske, 1959) has been employed by Jackman (1973) in evaluating the effect of acquiescence in some widely used personality scales. Response acquiescence was shown to represent a strong methods factor in the F, Anomie, and Selznick-Steinberg anti-Semitism scales. Acquiescence in this study was strongly related to education, suggesting that past demonstrations of relationships between education, authoritarianism, and anti-Semitism may have been seriously confounded.

Although concerns about the presence and potential effects of response biases have apparently been revived, an equally important consideration is how to take it into account in the analysis once its presence has been determined. Jackson (1967:113) observes that every investigator wishing to study
the nature of a personality variable cannot be expected to embark upon a program of error analysis. Furthermore, it is unreasonable to expect that researchers can embark on wholesale replication of past research for obvious reasons. This approach is manifestly impossible for large scale survey research undertakings which are becoming dominant in the field. Thus some balance must be found between control of response bias in item and scale construction phases, experimental controls on the situation in which instruments are administered, and ad hoc statistical controls which apply corrections to data collected.

Statistical controls appear to hold the most potential in survey research applications. The alternative, instrumental estimation and control of response biases similar to those to those employed by Carr (1971), requires rather elaborate administration procedures, as well as the introduction of a large number of variables which are not directly related to a study's objective.

However, reactions to the use of statistical controls have been mixed. Jackson (1967) prefers to use them as a last-resort salvage operation, while Liu's (1971) rationale treats statistical correction as a technique for removing bias that cannot otherwise be controlled through instrument, and experimental design. Both extremes are put into perspective by McGee's (1967:30) survey of the "state-of-the-art" in
response set assessment.

There appear to be two groups of people with opinions about the acquiescent set. The first group are those who have defined acquiescence as a test response. They tend to investigate through multivariate procedures, by correlating and factoring agreement responses and finding that they cluster in such a way that they can only meaningfully be labeled as an "acquiescence" factor. These people have data that reflect acquiescence. The other group has been concerned with the personality variable. They have expected to find consistent item response behavior across tests, and predictive efficiency of scores for nontest behavior. Because this group has been disappointed they have been led to consider the whole business as a big myth.

There is a diversity of views about the ways to control or take into account response bias associated with the measurement of attitudes. The present study will elaborate on alternatives for statistical control of survey data on attitudes where experimental controls are difficult and paper and pencil techniques prevail. Limiting the examination of bias to the paper and pencil methods of attitude methods of attitude scaling, the following section will explore the conceptual bases for response biases which lead to problems of measurement presented in this section.

Response Set

In his discussion of some of the historical antecedents of current response set perspectives, McGee (1967) notes that response set has been an issue for over fifty years, albeit in various guises. Among the terms that have been used to label
response set phenomena is that of attitude. If attitude is taken to mean a preference for, and a motivational disposition toward, or away from some object then, as Triandis (1967) has observed, it is apparent that many of the determining factors in behavioral responses are in fact coterminous with attitude. McGee (1967) points out that like many other foci of intensive research activity, response set has taken on a large variety of meanings at different times, under different conditions, and for different persons.

Three terms, set, style, and bias, appear to refer to the same type of confounding influence. Perhaps a primary distinction should be made between those who view response set as a psychological trait whose presence is manifested not only in test-taking behavior, but in role-playing, and other group activities, with those who see set as an artifact of measurement devices. A key distinction between trait biases, and method biases is that the trait manifests itself across a variety of behavior settings, while method artifacts are demonstrable only under given test situations, and only when a given class of measurement instruments are employed.

Three fairly distinct classes of response set have emerged in the course of a large number of investigations. They will form the basis for the following conceptual delimitation of their modal properties.
The first class of response sets are those which are embedded in the socio-cultural matrix of a subject. They arise out of the interaction of personality patterns, cultural and group norms, and elements of the situation. This class is typified by the type of set labeled social desirability.

A second class of modal set behavior involves the various dimensions of acquiescence. Acquiescent behavior, frequently termed "yea-saying", and "nay-saying" has been observed to be related to at least two dimensions of personality, the intellectual, and the impulsive. The former dimension is manifested by overt characteristics such as verbal ability. The latter dimension reflects more covert personality traits, such as reflectiveness, and introspectiveness.

The third class of conceptual orientations relies heavily on artifacts of method, and interaction between item content and personality traits for its definition of response set. Proponents of this point of view (Jackson, 1967, 1960; Messick, 1961, 1962; and Peabody, 1961), see bias originating in the construction and use of the measurement instrument itself. Attributes of the instrument such as content, or item keys may force, or elicit set which is not a generalized personality characteristic.

The variety of conceptualization in response set research includes phenomena which has some of the same properties as attitudes, and phenomena which are predominantly method
artifacts introduced in the measurement of attitudes, and other psychological traits. In the following section some of the more important findings within the three major classes of response set research will be discussed.

Social desirability

The conceptual framework for delimiting and analyzing response set appears to have followed two rather divergent paths. A major assumption in the method developed by Edwards (1953, 1957, 1959) for assessing the impact of social desirability on the scaling of stimuli, is that the evaluation of an object is to some extent determined by normative expectations of the subjects who perform the scaling. Social desirability is conceived of as a quasi-personality trait which, in itself, is relatively unimportant. It is, however, a type of response set which does affect the determination of other personality traits.

The uniqueness of the social desirability set is that it is determined in part by the socio-cultural milieu of individuals who subsequently rate cultural objects. The normative bias in social desirability is given frequent recognition, for Edwards (1967:64) notes that scores on various personality trait scales are correlated with scores on the social desirability scale in such a degree that the common personality trait appears to be a tendency to give socially desirable responses. Social desirability is a confounding
factor which tends to obscure individual differences in trait evaluation. But of equal importance is the fact that Edwards (1967) does not consider desirability criteria to be generated by a specific cultural milieu. He notes that social desirability scale values (SDSV) are highly reliable and highly correlated even when ratings are taken from groups which are culturally quite different. Furthermore, individuals' ratings on personality and social desirability statements are strongly correlated, and the probability of a true response to a socially desirable self-descriptive statement is linearly related to the SDSV of that statement.

No claims as to the explanatory power of social desirability scales have been made. The focus of investigations are oriented toward the global problem of response set which recognized that the construct underlying a behavioral response is always measured with error. Social desirability labels, and estimates the magnitude of one source of such error. The specific effect which is called to attention by social desirability research is the impact of normative factors in the evaluation of scale properties.

Response acquiescence

A construct closely related to social desirability is response acquiescence. Like desirability, it is a component of personality. However, it has its origins within the individual rather than in a social milieu. The theoretical
importance of acquiescence has been stated at length by Messick (1967). Acquiescence is defined as an individual's tendency to agree, or disagree with statements to which the subject cannot give a meaningful answer, either because the subject lacks knowledge specific to the question, or because the subject cannot ascertain the meaning of the question. Acquiescence is essentially a statement of how a subject functions under conditions of vagueness or ambiguity.

The study of acquiescence has focused on subjects' response tendencies when the meaning of a question is ambiguous. Messick (1967:120) has observed that not only is acquiescence unlikely to occur when the subject has specific knowledge about the answer, but it is also unlikely to occur when some other basis for evaluating the meaning of a response, such as desirability, is available. Acquiescence bias appears to be most prominent in scales that are relatively neutral in desirability, and tends to decrease steadily in influence as scales become either more or less desirable. The effect of acquiescence also tends to become more prominent as the generality of the sentence subject or object increases. Acquiescence is less likely to be a factor when the subject refers to the individual responding rather than to another person, or an abstract principle.

Two psychological processes which are thought to be important in eliciting acquiescent responses are interpretation, and impulsiveness. The degree to which interpretation
plays a significant part depends to large extent upon the level of intellectual and verbal ability. Impulsive acquiescence, often labeled "yea-saying", is a pattern of response which often arises when test items display vagueness or ambiguity, or when a response to certain types of items could place the respondent in a favorable or unfavorable position. Couch and Kenniston (1960) have found that "yea-sayers" tend to react quickly and impulsively in judgmental tasks, while "nay-sayers" tend to be more reflective and analytical.

Acquiescence may also be explained in terms of socio-logical constructs. It is possible that questionnaire methods of obtaining information about knowledge and self-descriptive characteristics may tap only a portion of the interpretive process which, for an individual, establishes identity and defines reality. These methods depend implicitly on the situation-defining processes which are the foundation of Symbolic Interaction. The central characteristic of the interpretation problem would appear to be based on incomplete, or nonexistent role definitions and role prescriptions as seen from the subject's point of view. This perspective is supported by findings which indicate that acquiescence is maximized when item content is ambiguous, or when evaluative judgments are made with respect to nebulous objects.
Response to a questionnaire item at best apprehends only one stage in an interactive, reality-defining process. The extent to which acquiescence is a trait in the psychological sense, or a position initially taken in a negotiation process, is something that may be determined in future research.

Method artifacts

A third perspective that has been employed in evaluating response set places the origin of bias in the instrument used to elicit and record a response. This approach has been given strong impetus and support by Psychometricians. Attributes of response set are treated as a form of bias to be isolated and discarded, rather than as a relevant dimension of personality.

Proponents of trait explanation of response set have assumed that acquiescent response is consistent for different content, and for many situations. That is, an individual's response tendencies are predictable if the characteristics of personality traits are known. An alternative viewpoint, expressed by Jackson (1967), is that different interpretations should be given for varieties of acquiescence elicited by, and interacting with different types of item content and subjects. He has provided a set of precise distinctions among varieties of response sets in terms of their denotative properties.

Variance associated with content refers to response consistencies over time, and with respect to similar instruments. It is generated by differences in personality traits,
attitudes, or beliefs. Variance associated with response style refers to expressive consistencies, such as "yea-saying", which are consistent over time, and in a variety of situations. Variance associated with response to formal item properties is a more limited form of response set. Its operation is restricted to one point in time, and a particular test situation, or measuring instrument.

Conditions which are thought to contribute to instrument bias include: unfamiliarity with, and difficulty in understanding the language used in items, lack of knowledge about the correct response, lack of saliency of the object or referent, and low evaluative significance of the object. Micklin and Durbin (1969), for example, have examined the syntactical dimensions of item content as a source of bias in scaling social attitudes. The dimensions considered included sentence complexity, active or passive voice, and the expected direction of evaluation, either positive or negative. Their conclusions, although tentative, point out an important, but neglected consideration in item construction. It cannot be assumed that linguistic variations among items in an instrument result in random, rather than systematic errors.

Noncontent factors which may elicit acquiescence can originate in the response framework itself. For example, subjects' responses to items measured on a nine-point scale might result in scores having a range of five to nine. These scores,
moreover, might be maintained over heterogeneous item content. Thus, it could be inferred that acquiescence may result from individual propensities to use a restricted range of a scale continuum. An equally important consideration is that by the use of a different scale continuum, acquiescent behavior may be modified. This is an assumption in the use of forced-choice scaling models.

The importance of recognizing and controlling for response bias has been stated by Loevinger (1957) and others as being a necessary precondition for achieving high construct validity. Two methods of control are generally brought to bear on the problem; the development of separate scale components for content and set which are employed in cross-validation, and statistical methods for estimating and separating set and content variance.

Instruments frequently incorporate the widely used technique of balanced scales, in which an equal number of items are keyed true and false. Scales employing a response continuum would include items in which subjects' agreement implies functionally equivalent properties to items eliciting disagreement. Item content presents a number of difficult problems in scale construction. For example, not all content associated with a homogeneous factor elicits set to the same degree. When using item reversals, it is very difficult to construct items in which content represents the property-space
of the construct at both ends of a continuum.

Statistical controls frequently applied after the development and administration of the measuring instrument include factor analysis in which marker variables are embedded, partial correlation, and regression. Marker variables are scale items which are known to be good representatives of a construct by having shown consistent factor loadings over a number of replications of studies in which the construct was involved. The use of marker variables in subsequent studies helps to identify or label factors which are defined upon new scale items. The factors identified may represent types of response set as well as substantive theoretical dimensions. In the case of response set factors, once they have been identified, appropriate techniques may be utilized to control their influence. A desirable property of the partialling method, especially when content is deemed more important than set variance, is that after estimating and removing the effect of set on a given scale the residual content variance in the scale is independent of the variance due to response set.

Research orientations

The perspective taken in this dissertation is that response set arises in part from a reaction of personal characteristics of an individual with properties of a measuring instrument. The specific concern will be with the case in which the measuring scale does not fit the conceptual
categorization, or discriminating ability employed by an individual in his every-day behavior. This reactivity yields responses which may be fractionalized into "true" orientations toward an attitude object, plus some contribution due to the type of measurement model employed. The model under study is the Summated Ratings scale with some of its variations.

Evaluation of response biases will focus upon internal and external validity of scales employed in attitude measurement. Internal validity is associated with the particular model used to estimate relationships among component items of a scale. External validity concerns itself with the issue of generalizability of conclusions reached in an experiment. In addition to depending upon construct validity, and the validity of the experimental design, it also depends in large measure upon the item sampling frame, and the question of whether the elements in the sample fit the property space of the concepts under investigation.

Much research in the assessment of response set has focused on the ability of the set factor to discriminate among groups. For a particular type of set the interest has been in whether it discriminates among males and females, schizoids and psychotics, physically well and physically ill. Some studies (Fredrickson and Messick, 1959; Jackson and Pacine, 1961) have treated response set as an independent variable, and have examined its relationship to such psychological constructs as verbal ability, and impulsiveness. Edwards'
(1967:48) review of the evidence for the social desirability factor in judgmental scaling of stimuli suggests that response set defines a continuum upon which statements are placed; their location arising out of a complex interaction of stimulus, group, and cultural norms.

In this investigation response set will be regarded as a nuisance factor. Rather than examining it as a construct in its own right, it will be regarded as a potential source of contamination in the construction of scales, and in the evaluation of relationships among constructs of theoretical interest.

The problem which is faced is that of determining methods for estimating the degree to which response set may exist in a given scale, and implementing techniques so that its influence may be removed. A necessary condition for the acceptability of a procedure is that the effect of its application must not impart a consistent bias toward uniformly stronger or weaker relationships among variables. That is, it is as important that the absence of relationship be shown, as it is that a relationship is present. Phrased in terms of convergent and discriminant validity, it must be demonstrated that common variance due to artifacts of method is eliminated, or at least reduced when conceptually distinct constructs are investigated. In the case of scale development, convergent validity of a set of indicators should be enhanced through the removal of error due to response biases.
CHAPTER 4. EMPIRICAL APPLICATIONS

This chapter will be concerned with integrating the methodological principles of scale construction with some recent developments in techniques for estimating and controlling the effect of response bias in attitude scaling. The first section will examine some of the more important characteristics of the Summated Ratings scaling model and the conditions under which response biases may be incorporated into resulting scale values. The second section will focus on procedures for estimating the degree to which response bias is present in a scale. Of primary importance are techniques which may be applied to the data on an ad hoc basis in order to maximize the utility of response set correction for survey research. The third section in this chapter states the research questions and hypotheses that will guide the subsequent analysis of data.

Scaling Methods and Response Biases

Jackson (1967) has indicated that there are two fundamental approaches to controlling response set. The first concerns itself with the problem at the design and development stage of a research project. Its emphasis is on controlling sources of bias before they have had a chance to operate. Among the techniques utilized are controls on item content, statement syntax, and different types of response formats such as true-false, forced choice, or free response. These
techniques represent formal criteria employed in instrument development, and are independent of constructs under investigation.

A second general approach relies upon statistical disaggregation of components of content and response set variance. Frequently, studies are designed so that a measure of the amount of response set variation may be obtained. A design of this type employs two or more scales of the same, or closely similar content presented on different forms. For example, one form may contain positive statements designed to elicit agreement; the other uses the negative of the statements to elicit disagreement.

In many investigations, especially those which use large-scale survey techniques for data gathering, the latter design-oriented method for evaluating the effect of response set is not feasible. Situations in which formal criteria will be the sole means of controlling response set will be in studies whose major interest is in substantive issues, and in studies which employ secondary sources of data.

For these reasons the rationale of a statistical method for response set correction must include among its conditions the fact that estimates must be made, and corrections applied to the same set of data. A second condition is that a procedure which is devised must not impose its own bias through estimation and correction techniques. That is, the magnitude
of measures of association estimated before, and after the correction has been applied must not be consistent with respect to the technique. A correction must allow for the possibility that removal of bias may result in weaker or stronger relationships among items in a scale, and among dependent variables and adjusted scale scores.

Among the objectives in developing a multiple-item composite score is that of using it as a rank of an individual's scale value with respect to scores of other individuals. The use of a composite also means that effects of less desirable scale items tend to be averaged out. Under certain conditions, however, the error which is present may not be essentially random, and it may not cancel out over the aggregate of items. This type of error, while random with respect to subjects, is systematic within any one subject. That is, a particular response pattern is predictable regardless of item quality.

Differences in scale values represent the subjects' involvement with scaled objects. Sherif and Sherif (1967:112) note that it is the degree of ego-involvement with stimulus objects which is represented by scale values. It is from this that attitudes may be inferred. Consequently, the criteria by which an individual expresses his involvement assumes great importance. In the investigation of substantive issues, inter-individual differences are of interest, while intra-individual
differences in discriminai processes contribute only random error of measurement. When the investigation centers on the issue of response biases, then systematic, intra-individual patterns of response form a basis for analyzing response set.

A number of assumptions are usually made about items which constitute an attitude scale. These assumptions may or may not be tested in the development of the scale. First, it is assumed that the object or stimulus which evokes a response is an unambiguous representative of its global construct. In domain sampling terminology, this means that the theoretical construct has been defined precisely so that indicators of its extensive properties may be included or excluded from the domain with a fair degree of precision. Secondly, it is assumed that on the average, the intensity of the item stimuli in the domain are equivalent. Third, the syntax of statements is assumed to contribute to little, if any, variability among items. That is, syntax is nonreactive.

Among subjects in a population, a tentative assumption is that there is little, or no interaction between attitude stimuli and structural characteristics of the population. Such characteristics would include class membership, levels of educational attainment, or occupational distribution. When the term interaction is used, it is meant that the interpretation of the stimuli are similar among various subgroupings of a population. Subgroups share a common core of meaning with
respect to cognitive properties of attitude stimuli. This does not preclude the existence of differences among subgroups on the evaluative dimension of attitude. As a consequence, behaviors with respect to similar stimuli may differ between subgroupings in a specified population. This assumption allows constructs to be generalized to many different populations.

A final, implicit assumption is that the property space of the attitude is fixed with respect to the target population. Attitudes representative of sampled subjects will differ only in degree, not by type. This assumption has its basis in the cultural milieu in which the sampled population is located. For example, there are culture-areas in the northern islands of Japan in which attitudes toward individualism are virtually undefined because the concept of individualism is philosophically inadmissible to a large part of the population. If persons living in this culture area were incorporated in a nation-wide sample in which attitudes toward individualism were being investigated, then this assumption would not be met. Inferences made, on the basis of the sample data, with respect to attitudes of the islanders would be wholly inappropriate.

The objectives of scale analysis focus on examining the indicators of a construct to determine how adequately these indicators represent a hypothetical domain of indicators and meet measurement criteria. Two statistical indices are
commonly used in making judgments about the adequacy of con­struct representation and measurement of constructs. These are coefficients of scale reliability and validity. Numerous articles (Heise and Bohrnstedt, 1970; Althauser and Heberlein, 1970; Cattell, 1967; Cronbach and Meehl, 1967; Nunnally, 1967; Bohrnstedt, 1970) on reliability and validity which give detailed insight into theory and applications have appeared in the sociological literature.

Typically, the assessment of these properties of measurement models depends in large part upon simple product moment correlation coefficients or variance-covariance matrices among a set of scale items. The use of the correlation coefficient or covariance is based on two key assumptions about the items: the relationships among items are linear, and scale total scores are additive.

The importance of the linear model has been pointed out by Heise (1973). He notes that of the three basic models available to sociologists; cumulative, nonmonotonic, and linear, the last offers the greatest degree of utility in multivariate research, provided appropriate conditions are met when considering the underlying theoretical dimension on which indicators of a construct are distributed.

Summated Rating scales are typical of linear models used in scaling and measuring attitudes. These scales have been found useful in two types of applications; those concerned
with scaling a domain of content, and those concerned with measuring the relative intensity of attitudes in a population. These applications are distinct; the blurring of these distinctions has caused numerous conceptual difficulties (cf. Nunnally, Ch. 2).

When the Summated Ratings model is employed to scale items, a point on a number continuum is used to represent the amount of an attribute possessed by that item. When used as a measuring technique, the model represents the sum of a number of implicit scalings by a single subject. The sum may then be employed to rank that subject relative to other subjects who have performed similar operations.

Although the numerical range of the scale continuum may range from five to ninety-nine points depending upon the application, all scales of this type hold certain features in common. General characteristics of Summated Ratings scales are:

1. The neutral point on the underlying attitude dimension is represented by the midpoint of the scale range.
2. The midpoint separates negative affectivity from positive affectivity.
3. Intervals between scale points accurately reflect different levels of intensity on the attitude dimension.
Items are additive in representing greater or lesser amounts of the attitude in question.

If it is assumed that scale values associated with scale items are additive, and that the relationship between the total score for the scale and the magnitude of the attribute possessed by subjects is linear, then the effect of response set generated by differential discriminable perception assumes considerable importance. Couch and Kenniston (1960) have indicated that Summated Ratings scales characteristically contain a component of response set, and that its elimination through scale-building methods was unlikely given the constraints on question construction for concepts which are scaled using this model. The presence of response set may lead to faulty inferences about consistency in the item domain which is usually assumed to be unidimensional, representing a single construct.

The type of response set referred to by Couch and Kenniston (1960) has been given the label "response style" by Rorer (1965). It refers to a tendency to select a particular response category a disproportionate amount of the time regardless of item content, ambiguity, or desirability.

An extension of this approach has been made by Liu (1971), and Liu and Wolins (1973). Their position is that individuals have idiosyncratic tendencies to use particular portions of continuous scales, and that this tendency, called set, is reflected by the standard deviations of scores for all items.
associated with a given scale. The basic idea is that an individual who exhibits set will have consistently large or small standard deviations on any scale regardless of scale content.

A consistent use of certain portions of a continuous scale may reflect individual discriminative perception. Persons having little discriminative ability will tend to rate items on a more restricted range of a scale continuum than persons who have a more refined discriminative ability. Relative changes in the degree to which set is exhibited may be reflected in the degree of ego-involvement a respondent has with the content of items used in a scale.

By taking the intra-individual standard deviation (sigma) as the index of the degree to which differences in discrimination exist within a group of subjects, a determination must be made of the properties a scale must possess so that the index can be reliably estimated.

One desirable property is a reasonable range on the response continuum, such that individual differences are likely to occur. Edwards and Walsh (1964) have utilized a three-point scale, while Liu (1971) has employed a ninety-nine point continuum. The former is probably excessively constrained, while the latter would appear to have far more scale points than could be profitably utilized by even the best discriminating ability.
Content factors which will affect the range of a scale continuum include midrange stimuli. These are statements which are not at either extreme of the content domain, and are thought to be most susceptible to differences in discriminable perception. The greater the number of these statements in a scale, the greater the range on the response continuum must be to estimate individual sigmas.

Another scale property which may tend to elicit response set is the relative homogeneity of item content. Scales which are highly homogeneous on this factor will be most consistent in magnifying individual differences. An additional criterion of content is that the semantic qualities of statements be similar in their extremeness or intensity. These factors reflect cognitive and affective components of scale items.

Techniques for Estimation

As a starting point in the development of a method for estimating and correcting a scale for response set, the basic criteria discussed above will be employed. The estimation of coefficients representing response bias, and their use in a model appropriate for removing its influence, has two major objectives. First, the correction will allow a more precise inference of scale validity. That is, scales may not appear to "hang together" primarily because of the incorporation of error variance due to response biases. Secondly, more precise
scales will enhance the confidence that may be placed in the results of an investigation. Removal of one more source of bias eliminates an alternative explanation for empirical findings.

The most commonly used measures of association are product moment correlations. When applied to scale-building methods, the use of these coefficients presumes that the relationships among scale items are linear, and that the contributions of each item to the total scale is additive.

For a graphic representation of these assumptions, an item trace-line may be employed. The trace line for an individual item may be described by a cumulative probability distribution in which the ordinate represents the probability of a positive endorsement and the abscissa represents the evaluative significance of the attitude item. The linearity assumption is approximately met even if the item trace lines are skewed. The only restriction is that the skewness of pairs of items be in the same direction (cf. Nunnally, 1967:142-47). The implication is that the cumulative frequency distribution of item scores relative to the quantity of the attribute being measured must be approximately linear in form.

Departures from a linear trace line for a quasi-continuous scoring system, for instance more than seven categories, may be due to one or both of the following conditions. The content has been sampled from the extremes of the construct domain, and
consequently does not tap the full range of attitude in the target population, or individuals' use of the measurement scale does not represent the potential range of scale values that would normally be expected from the distribution of item content. The most important consideration involving item trace lines is that they be parallel.

The absence of parallel trace lines represents the condition of nonadditivity. Two gross features are conditions under which item trace lines show no variability, that is they are horizontal with respect to other trace lines, or they are of approximately the same magnitude as other lines, but in opposite directions. Trace lines of the former type may occur when the item is vaguely worded, when the amount of an attribute in a population is constant, or when an item's phrasing is too extreme to show response variability. Trace lines of the latter kind are often encountered as a result of item reversals, and may be easily adjusted.

Nonparallel trace lines also occur because of the heterogeneity of items subsumed under a hypothetical sampling domain. To the extent that subjects are consistent in their response to different items, proportionality among item endorsements is preserved. However, if individuals differ in the way in which they employ a scale, and these differences are due to differential discriminative perception, then proportionality in the strength of item endorsement will not be
preserved. The absence of proportionality is associated with nonadditivity, and implies that person-item interaction is present.

In developing an estimator for response set, the standard deviation of an individual's scores on items associated with a particular scale has been found to be both conceptually and statistically useful. However, the method by which response set is estimated is not a general one, being restricted to a rather limited range of scales.

The transformation developed by Liu (1971) represents an individual's response to the \( k \)th stimulus in a scale as:

\[
Z_{ijk} = \frac{P_i - S_j + X_{ijk}}{s_i}
\]

\( P_i \) is the position of the \( i \)th individual on the scale

\( S_j \) is the position of the \( j \)th stimulus

\( X_{ijk} \) is the individual's raw scale value on the \( k \)th item

\( s_i \) is the \( i \)th individual's standard deviation of \( k \) item values on the \( j \)th stimulus.

The \( s_i \) for each subject were calculated on normalized ranks of a ninety-nine point scale. Adjustment is accomplished by dividing the mean composite score of the uncorrected items by the \( s_i \) for that scale. The result of the transformation is an adjustment of the scale average by the response variability.
Liu's (1971:30) rationale for the procedure is that the adjusted score is a ratio of two statistics, both of which are subject to error...the unadjusted score has only one source of error. Therefore, a decrease in reliability is anticipated as a result of the adjustment...(furthermore) the adjustment should result in a decrease in the amount of irrelevant bias in the measure...(and) should result in an increase in validity through controlling this irrelevant source of variance.

This approach is acceptable only for a limited range of measurement methods. In particular, Liu's (1971) estimate does not allow assessment of internal consistency for specific sub-scales. The scale used by Liu (1971) was in effect a composite of scales, where as he indicated, the first measurement scale includes four personality sub-scales. It is not clear whether these sub-scales were intended to represent different dimensions of personality, or whether they were treated as replicate measurements on a single dimension. These assumptions which have apparently been made are precisely the ones that are subject to inquiry.

The evaluation of scales used in sociological research usually includes tests for scale unidimensionality. If the above method is employed, a high degree of spuriousness is introduced in measures of association. Fuguitt and Lieberman (1973) have investigated the properties of correlations calculated on variables containing common denominators. Their findings have direct application to the correction technique...
described above. If an attempt is made to estimate the internal consistency of a scale, the consequences of applying this correction will be uniformly high inter-item correlation because of the common $s_i$ component in each variable. Consequently if the items exhibit correlations of magnitude zero before correction is applied, the transformation will induce correlations considerably larger than zero.

Inferences made from an assessment of internal consistency are particularly important in Sociology. Scales employed by sociologists are rarely as well-behaved as those used by psychologists: the former usually investigate a wider range of constructs and infrequently replicate investigations in which identical scales are used. Furthermore, scales used by sociologists tend to be rather short, on the average containing six to ten items compared to Liu's (1971) scales which have thirty or more items. A result is that estimates of individuals' scale sigmas would be based on limited amounts of data. Each item in a scale will contribute a substantial component to an estimate of an individual's standard deviation for that scale.

A major issue in developing a technique for estimating and adjusting for the type of response bias that has been discussed, is how to transform the original scale scores without contaminating presumably valid information. While the estimate of response set developed by Liu (1971) appears to be
theoretically sound, a different technique must be found for employing this estimate to correct item values.

The method that is proposed for correcting scale items for response set involves the treatment of individual scale-specific standard deviations as suppressor variables which are unspecified sources of variance in Summated Ratings type attitude scales. Sigmas that are estimated for each individual are used to represent the relative degree of that individual's discriminant dispersion with respect to the set of indicators associated with a given construct. The objective of correcting a normative scale so that it is free of individual differences indicates that a variance partialling method may be desirable. This approach has been suggested by Jackson (1967) in his discussion of methods of statistical control.

What is being proposed is that the estimates of individual scale sigmas be treated as if they were additional predictor variables in a multiple regression model where attitude scale items are the predictor variables and behavior is a criterion variable. The additional predictor included in the model represents systematic variance which is due to response set. Its effect on correlations among attitude items and a behavior index will be similar to the illustration given by Nunnally (1967:162).

The method proposed is similar to Analysis of Covariance. The Analysis of Covariance model seeks to determine the effect
of treatments on a dependent variable which has been adjusted to remove variance "explained" by a concomitant variable. In this study, however, unwanted variance is removed from a variable which may be treated as either dependent or independent in subsequent analysis. In this approach, the simple linear regression model

\[ \hat{y}_{ik} = \beta_0 + \beta_{ik} X_k \]

is used to generate a predicted value for the \( i^{th} \) item of the \( k^{th} \) scale where \( X_k \) represents a vector of individual sigmas calculated on all items in the \( k^{th} \) scale, and \( \beta_{ik} \) is the regression coefficient of the \( i^{th} \) item in scale (\( k \)) regressed on \( X_k \). For simplicity, the subscript denoting observational units has been omitted.

The resulting corrected scale item value is simply

\[ e_{ik} = y_{ik} - \hat{y}_{ik} \]

the residual variation in the scale item not predictable from its scale standard deviation. It will be observed that the index of response set, and the corrected scale item values are orthogonal to each other.

A condition on the use of individual standard deviations as indicators of response bias is the amount of information on which these estimates are based. This is especially important in view of Liu's (1971) findings that discriminant dispersion
varied among different types of scales. Obviously, the larger the number of items included in the calculation of sigma, the more reliable that estimate will be for an individual with respect to a given scale.

Two different sets of assumptions may be employed in the resolution of this issue. For instance, the assumption that a domain-sampling model has been used to obtain scale items may be discarded. Scale items may be regarded as being explicitly constructed to represent, as closely as possible, the extensive properties of a construct. This implies the use of a fixed-effects model under which inferences may be made only to those items included in the scale. In effect, the sigma values calculated on these items are estimates which have no sampling variability.

Alternatively, the data may be analyzed in terms of a random-effects model which closely approximates the concept of domain sampling discussed by Nunnally (1967:175). If the items in a scale can reasonably be subsumed by a larger set, then an estimate of individual sigmas depends on the variability in sampling from the domain, and the number of items sampled.

When the focus of research views response set as a variable of theoretical interest, and relationships between response set and its correlates are evaluated, then estimates of sigma must be as precise as possible. This necessitates a
rather large number of scale items. For example, in psychological investigations of relationships among indices of response set and personality traits are examined, rarely are fewer than fifteen items used in a scale.

Conversely, most sociological research is focused on defining normative constructs which are uniform in their effect in certain populations. In this context, response set, as an index of individual differences rather than common attributes, may be treated as a nuisance variable which may be discarded. In this context estimates of response set may be based on as few as three items. This is the minimum number of items required to define a factor of theoretical interest. Estimates of sigma will not be very precise, but should be sufficient if response set variability is not treated as a variable of theoretical interest.

To determine whether or not the technique for correcting scale items has an effect, the analysis will focus on two distinct types of statistical evaluation. The first stage of evaluation will concern itself with determining whether the corrected items enhance the degree of scale internal consistency, thereby strengthening inferences that may be made about the validity of the construct represented by the indicators. Scale properties that may reflect the effect of removing response set include estimates of additivity, homogeneity of item variances, symmetry of item covariance
matrices, and scale reliability. Furthermore, there should not be substantial change in relationships among different scales after they have undergone correction.

An appropriate statistical model for this task is a randomized block design. In this context, subjects are treated as block effects, scale items as treatment effects, and block-treatment interaction as an indicator of the degree to which individuals differentially perceive measurement scales. Person-item interaction will be treated as a consequence of the way in which subjects use the scale response format. Response inconsistency is reflected in nonproportionality within blocks, as a factor generating respondent-item interaction. Tukey's test of additivity may be applied to determine whether a significant degree of nonadditivity is present in the scale.

To the degree that nonadditivity is reduced by correcting scale items for response bias, the utility of the method is supported. Because an extraneous source of variability has been removed from the items, it is also expected that estimates of internal consistency will be improved. A decrease in nonadditivity will result in more homogeneous covariances among scale items. This will occur if the following condition is met in a partial correlation model

\[ r_{12.3} > r_{12} \quad \text{if} \quad r_{13} \text{ or } r_{23} < 0 \]
where $r_{12}$ is the correlation among scale items, and $r_{13}$, $r_{23}$ represent the correlation between scale items and estimates of individual scale standard deviations.

The problem of nonadditivity is conceptually related to values of sigma. More ambiguous or vague items in a scale will generate inconsistencies with respect to a dominant pattern of response. Those items which deviate most from a norm or scale pattern will be the items which undergo the greatest amount of adjustment.

The second stage of evaluation is concerned with how well the corrected items work after forming a composite. In psychological research this is usually tested in terms of composite-criterion relationships. In this investigation, the interest is in the effectiveness with which attitudes may be used to predict managerial behavior in an organizational environment. Two important considerations in evaluating the relationships between attitude scales corrected for response bias, and indicators of behavior are: (1) that the correction does not impose systematic bias in measures of association between attitudes and behavior, and (2) where the magnitude of a relationship may be predicted theoretically, corrected scales should yield better estimates of association than uncorrected scales.
Research Questions and Hypotheses

In specifying the research questions and hypotheses which will guide the application of method, and presentation of results, theoretical orientations and construct definitions presented previously will be relied upon. The constructs cover substantive areas of attitudes, organizational behavior, and applications of moderator variables.

Attitude constructs have been specified to reflect the following characteristics of managerial functions.

1. Principles of tradition-centered management.
2. Control operating practices of the firm to minimize the impact of events external to the organization.
3. The degree of individualism exercised by a manager in making policies and decisions.
4. Active rather than passive managerial involvement in organizational operations.
5. Directing, leading, and motivating employee performance.

The effect of managerial attitudes will be evaluated in terms of their relationships to performance in a managerial role. Individual behaviors considered are associated with characteristics of managerial tasks which include:

1. Directing firm operations.
2. Effort devoted to employee training.
3. Attention given to staffing and recruitment.
It is hypothesized that personal characteristics and attributes of the manager will influence his role performance. The above attitude orientations should be related to the functional areas of managerial performance. It has been argued previously that organizations tend to develop structures and processes to suit their leadership and personnel, and will thus reflect attitudinal dispositions of management through implementation of corporate policy.

Past research has shown organization size to be a key factor affecting employee morale and performance. Breadth of experience is also considered to be an important factor affecting decision making behavior. A wide range of alternative actions may be evaluated when a manager is confronted with an unfamiliar or unstructured situation. A means of achieving a wide range of experiences is through job mobility.

Treated as moderator variables, these conditions may allow a more precise estimate of the effect of attitudes on behavior. Variables which are employed are:

1. Size of firm represented by the number of employees
2. The number of different firms in which a manager has held a managerial position.

The study has been designed to answer two general types of questions. The first type involves the issue of response bias, and its effect on the construction and evaluation of attitude scales. Response set, a particular form of response bias, has been investigated for certain kinds of scales
commonly employed in educational and psychological testing, under experimental conditions. The contexts in which this research has been conducted are not common to many sociological investigations in either the substantive area, or the general research design or survey studies.

Consequently, the methods by which response set is estimated and its effects removed have limited applicability to the majority of sociological analyses. Established methods have, however, provided the motivation for developing of analogous procedures for use with sociological concepts, data, and research designs. A major objective in this study has been to develop a rationale and method for estimating and removing the effects of response set.

Response set is conceptualized as an individual rather than a group attribute. Estimating and controlling for its effect on scale properties does not allow meaningful inferences to be made with respect to individual scale items. Evidence for effect and elimination of response set must be considered for the scale as a whole.

An optimal procedure for this evaluation would involve comparisons among scales whose items were grammatically and syntactically equivalent except for the measurement scale. For example, one scale might constitute an eleven-point continuum. It has been observed that the effect of individual discriminant dispersion is less evident on a scale with a
larger range of values than on one which provides very few response categories.

The conditions under which the methods in this study are tested are less than optimal, but perhaps more realistic. All responses have been scaled using the same number of response categories. The range of points on the continuum are large enough in number to inherently counteract some of the effects of response set. Consequently, in this situation the only feasible basis for comparison is one which compares identical scales before and after being corrected for effects of response set.

The evaluation method is realistic insofar as most field studies are not directly concerned with problems of measurement. Nor are survey items especially designed to facilitate this type of research. The method must be capable of dealing with response set on an ad hoc basis, under field conditions, and in the context in which data has been collected if it is to provide answers to questions of substance as well as method.

On the basis of these issues the following general hypothesis is proposed.

After applying the correction for response set, attitude scales will more closely meet the assumptions of the measurement model.

Specific attention will be given to the following properties of scales in testing the hypothesis.
1. Additivity of scale items.
2. Homogeneity of scale variances.
3. Symmetry of scale covariance matrices.
4. Estimates of scale reliability.
5. Orthogonality of scales.

Substantive issues are concerned with whether corrected scales do a better job of predicting managerial behavior than uncorrected scales. The basis for evaluating the effectiveness of uncorrected and corrected scales will be gains in the magnitude of measures of association among attitude and behavior indicators. This approach will be comparative for two reasons.

First, the scales that have been developed are variations of composites used in previous studies. The lack of a completely uniform conceptual orientation between studies precludes comparison on a scale-for-scale basis. Secondly, attitude scales reported in the literature tend to be highly unreliable in producing uniform estimates of relationships with criterion variables when units of analysis are taken from different populations. Adoption of an existing scale for use with the respondent sample in this study would be as likely to show as much sampling variability as measurement bias.

Moderator variables have been introduced to increase the specificity of the substantive relationships under investigation. It is felt that estimates of attitude-behavior
relationships will be enhanced if they are examined within different types of constraints imposed by the organizational environment. This should allow stronger interpretations of potential linkages.

General research questions which will be addressed include:

1. Inferring whether a relationship between attitude and behavior does, or does not exist.

2. Determining whether correcting attitude scales for response set yields differences in magnitude in measures of association between attitudes and behavior.

3. Determining the effect of selected aspects of organizational environment on attitude-behavior relationships.
CHAPTER 5. METHODOLOGY

A study by Warren et al. (1973) serves as the framework for this investigation. Attitudinal constructs have been defined as representing attitudes toward key areas of managerial performance in a profit-making organization. Behavioral constructs are variations on composites, developed in prior studies, which reflect performance in certain managerial functions. In this study both attitudes and behaviors are confined to the context of profit-making organizations. This approach will permit precise estimates of attitude-behavior relationships by minimizing potential differences in subjects' interpretation of item content, a condition likely to occur under a more general frame of reference.

The data consists of questionnaire responses completed by one hundred fifty-three managers of agricultural cooperatives in Iowa. The data were collected as part of a study undertaken by the department of Sociology at ISU in cooperation with the United States Department of Agriculture to investigate characteristics of managers and firms associated with a dealer training program. Stimulus materials consisted of a seventy-item battery of attitudinal statements, and questions pertaining to activities of managers in their respective firms.

The principal axis method of factor analysis is used in the initial stages of the analysis to assist in allocating indicators to concepts which represent attitudes toward
principles and practices of business management. A randomized block analysis of variance design is employed to assess the effect of response set correction on scale items (treatment effects). Multiple regression is used to partial out the effect of response set in individual items prior to constructing scale composites. Product-moment correlations are employed to comparatively evaluate the predictive power of attitude composites before and after correction for response set.

Scale Construction Techniques

Composites were constructed in a two stage procedure. Stage one involved tentative allocation of attitude items to one of the five conceptual categories. A total of fifty-one statements in the original seventy-item battery were used for this purpose. Statements which referred to orientations toward activities or principles which were primarily personal or non-organizational were eliminated immediately because they did not incorporate situational factors deemed necessary for strong attitude-behavior linkages. All items that were retained in this stage of analysis applied to some aspect of business management.

A correlation matrix containing fifty-one items was formed for the purposes of: (1) using a statistical criterion to resolve borderline cases in allocating items to clusters, (2) eliminating items which did not receive empirical support
for inclusion in any of the attitude clusters, and (3) assisting in reflecting items on which the scale-reversal technique had been applied.

A principal factors analysis and varimax rotation was used to determine whether the content related clusters were unidimensional by showing moderately high factor loading coefficients on only one factor, and a useful degree of orthogonality among factors represented by fewer than the original number of items on which they were defined. Each factor which was used to represent a construct was required to have at least three moderately high loadings in order that the construct could be defined operationally.

A procedural guide used in evaluating factors was to give primary importance to the content of items which loaded on a single factor, and secondary importance to the magnitude of factor loadings. Thus an item which had a high factor loading, but whose content was inconsistent with other items defining that factor, was likely to be discarded. Items which reflected the theme of the attitude construct, although their factor loadings were moderate, were retained.

The result of the evaluation procedure was the retention of twenty-one items out of the fifty-one which were initially factor analyzed. Subsequent factoring of the twenty-one items indicated that their placement on factors, and the relative magnitudes of their loadings were substantially the same
compared to the initial analysis on fifty-one items.

The results of the combination of substantive and analytical procedures yielded five major clusters which provide the basis for comparing the response set estimates and corrections described previously. To ensure that the data meet minimum statistical requirements for techniques associated with estimation and correction procedures, distribution properties of variables used in the analysis are next presented.

Attitude clusters - uncorrected

After clusters of items had been selected to represent the five attitude constructs described previously, an examination of cluster distributions was undertaken. The distribution properties of uncorrected item clusters are shown in Table 1.

Table 1. Distribution characteristics of scale item statistics based on original scale of measurement

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Item means</th>
<th>Item variances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \bar{x} )</td>
<td>( s^2 )</td>
</tr>
<tr>
<td>Traditionalism</td>
<td>9.11</td>
<td>3.46</td>
</tr>
<tr>
<td>Control</td>
<td>10.44</td>
<td>3.48</td>
</tr>
<tr>
<td>Individualism</td>
<td>7.34</td>
<td>1.48</td>
</tr>
<tr>
<td>Activity</td>
<td>11.05</td>
<td>10.30</td>
</tr>
<tr>
<td>Directing</td>
<td>12.83</td>
<td>0.64</td>
</tr>
</tbody>
</table>
The values are associated with the components of a cluster rather than with a single composite index variable. The distributions of all uncorrected attitude variables represent measurements taken on an eleven-point Certainty scale which has a range of scale values from zero to sixteen.

Table 1 shows that the cluster labeled Traditionalism is represented by six items. The average value of the means of the six items is 9.11, the smallest of the six means having a value of 5.55, while the largest is 10.59. The average variance of all six items associated with the Traditionalism cluster is 11.91, and appears to be relatively homogeneous with variance equal to 3.40.

A useful feature of this table is that it allows inspection of raw data items which make up the scale, without resorting to a large volume of summary statistics. It may be anticipated that scales with a larger range in the distribution of item variances will be less likely to have desirable scale properties than clusters which evidence a greater degree of homogeneity. That is, items which have large variances are useful, but scales which have much dispersion among item variances are not. Analogous statements may be made about item means.

To form scales representing each of the attitude constructs, items contained in each cluster were summed. The result is a typical Summated Ratings scale. Distribution
characteristics for each composite scale are shown in Table 2.

Table 2. Distribution characteristics of composite scale values on original scale of measurement

<table>
<thead>
<tr>
<th>Attitude scale</th>
<th>( \bar{x} )</th>
<th>S</th>
<th>( S^2 )</th>
<th>Range</th>
<th>Number of items</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditionalism</td>
<td>54.69</td>
<td>13.59</td>
<td>184.74</td>
<td>80.0</td>
<td>6</td>
<td>153</td>
</tr>
<tr>
<td>Control</td>
<td>41.78</td>
<td>8.56</td>
<td>73.23</td>
<td>43.0</td>
<td>4</td>
<td>153</td>
</tr>
<tr>
<td>Individualism</td>
<td>22.03</td>
<td>7.88</td>
<td>62.15</td>
<td>45.0</td>
<td>3</td>
<td>153</td>
</tr>
<tr>
<td>Activity</td>
<td>55.26</td>
<td>10.22</td>
<td>104.53</td>
<td>63.0</td>
<td>5</td>
<td>153</td>
</tr>
<tr>
<td>Directing</td>
<td>38.50</td>
<td>5.84</td>
<td>34.10</td>
<td>29.0</td>
<td>3</td>
<td>153</td>
</tr>
</tbody>
</table>

The mean of each composite is computed as the sum of its item means. Minimums and maximums are also easily derivable from knowledge of component minima and maxima. Scale variance is based on two components of variation; variation due to the sum of the item variances, and variation due to covariation among scale items. In general, scales with a larger number of items such as Traditionalism and Activity, will have larger total variances. A measure of the utility of a scale, however, depends not only on the total variation, but also on the proportion which may be ascribed to inter-item covariation. In Table 2 there is wide range in scale variances, but not all scales employ the same number of items. Consequently, scales with small variances are not necessarily poorer measures than
scales with large variances.

Managerial performance

The indicator of Role Performance was taken intact from a previous study by Warren, Mulford, and Yetley (1973:14). As they have defined it, Role Performance represents methods for acquiring resources from the firm's environment and techniques used to manipulate internal and external factors of production to facilitate organizational goal-attainment. Representative methods and techniques involve the use of field representatives in the marketing function, the kind of departmental organization employed in the firm, criteria used in making decisions about suppliers, and procedures used to protect investments against changes in market prices. Managers' verbal responses to twelve questions covering these topics were scored by judges using as the criteria, performance which would lead to successful management.

Specific components of the composite index for this variable are responses to twelve open-ended questions which have been coded on a scale with a range of one to ninety-nine. The index itself is the algebraic sum of the scores of the twelve components. The score on each of the twelve components was standardized to have a mean of zero and a standard deviation of one. The composite score is the sum of the twelve standardized parts and has a reliability of .69.
The variables Training, Staffing, and Directing are composite measures developed previously by Warren, Mulford, and Yetley (1973:11-12). The variable Training is represented by a six-item composite. The items assessed the amount and type of job orientation and training given to organization participants at the local level of the total cooperative organization structure. Items dealing with employee orientation focus on their goals and values, and on the basis for individual and corporate consensus. The items were standardized individually and were then summed to form the composite. The reported reliability of the composite is .70.

The Staffing variable is based, in part, upon a manager's report of criteria used in determining the number and qualifications of employees required by a firm. In addition, items which related to a manager's economic knowledge, level of education, and other personal characteristics were also used. A total of thirteen items was employed in the composite. A reliability coefficient of .73 was reported for the Staffing composite.

The variable Directing is based on a fourteen-item composite score. Nine items were designed to reflect a manager's perception of communication within his organization. Two items reflect participants' potential for communication with the firm's customers. The remaining three items measure the degree of actual communication among organizational
participants and customers. The reliability coefficient reported for the Directing composite is .65. These variables are used to represent the constructs associated with managerial behavior. Distribution properties of variables associated with managerial performance are given in Table 3.

Table 3. Distribution characteristics of variables representing managerial performance

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\bar{x}$</th>
<th>S</th>
<th>$S^2$</th>
<th>Minimum</th>
<th>Maximum</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role performance</td>
<td>0.0</td>
<td>4.83</td>
<td>23.37</td>
<td>-12.32</td>
<td>17.38</td>
<td>153</td>
</tr>
<tr>
<td>Staffing</td>
<td>0.0</td>
<td>6.14</td>
<td>37.66</td>
<td>-14.43</td>
<td>12.84</td>
<td>153</td>
</tr>
<tr>
<td>Training</td>
<td>0.0</td>
<td>3.80</td>
<td>14.46</td>
<td>-11.65</td>
<td>10.53</td>
<td>153</td>
</tr>
<tr>
<td>Directing</td>
<td>0.0</td>
<td>5.92</td>
<td>35.09</td>
<td>-14.50</td>
<td>16.66</td>
<td>153</td>
</tr>
</tbody>
</table>

Moderator effects

Moderator effects are represented as a single variable which encompasses two distinct dimensions: breadth of management experience and the size of the organization. Breadth of experience is inferred from the number of previous management positions held by a manager. Managers who have held several similar positions in different firms are assumed to have available a greater number of decision alternatives than those who have not had such experiences.
A binary code \((0,1)\) is employed to denote in which of two classes a manager is located. The class \((0)\) is used to denote those managers who have no management experience outside their present firm. That is, they have not experienced job mobility. The class \((1)\) denotes managers who have held at least two management positions, one of which is their present position. Their distribution is given in the row-marginal distribution of Table 4.

Table 4. Joint and marginal distributions of moderator variables: organization size and management experience

<table>
<thead>
<tr>
<th>Job mobility</th>
<th>Organization size¹</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Small ((0))</td>
<td>Large ((1))</td>
<td></td>
</tr>
<tr>
<td>Low ((0))</td>
<td>46</td>
<td>49</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>High ((1))</td>
<td>32</td>
<td>26</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>(3)</td>
<td>(4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>78</td>
<td>75</td>
<td>153</td>
</tr>
</tbody>
</table>

¹Numbers in parentheses \((\ )\) denote assigned group code number.

The second dimension, organization size, is a categorization of firms which is based on the number of full-time employees. Firms with fewer than eleven employees are placed in category \((0)\). The balance of firms are located in
category (1). The distribution of managers on this dimension is shown in the column-marginal frequencies of Table 4. The two dimensions combined yield four group classifications within which attitude-behavior relationships will be examined. Groups are labeled one through four beginning with the columns in row one, and continuing with columns in row two.

Response Set Estimates

Estimates of response set coefficients are based on intra-individual standard deviations of scores for a set of items associated with a given construct. These coefficients are calculated by the following method.

\[
SD_{ij} = \left( \frac{\sum_{k=1}^{N_j} (X_{ijk} - \bar{X}_{ij})^2}{N_i - 1} \right)^{\frac{1}{2}}
\]

- \( i = 1, \) number of observations
- \( j = 1, \) number of scales
- \( k = 1, \) number of items per scale
- \( X_{ijk} \) denotes the value of an item score for the \( i^{th} \) subject on the \( j^{th} \) scale. \( \bar{X}_{ij} \) is the mean scale score for the \( i^{th} \) subject. \( SD_{ij} \) is the standard deviation for the \( i^{th} \) subject of the scale items associated with the \( j^{th} \) cluster. There are \( j \) scales, each containing \( N_j \) elements. Thus the response set associated with each subject is represented by
one coefficient for each cluster. For convenience, the cluster-specific estimates have been labeled TSD, CSD, ISD, ASD, and DSD to associate them with the constructs Traditionalism, Control, Individualism, Activity, and Directing.

Distribution characteristics of these coefficients based on the sample of one hundred fifty-three subjects are shown in Table 5. Each variable represents a vector of individuals' standard deviations calculated on scores of items belonging to one of the five components. These estimates are treated as independent variables on which each item associated with a particular scale is regressed.

Table 5. Distribution characteristics of scale-specific estimates of individuals' response variability

<table>
<thead>
<tr>
<th>Variable</th>
<th>( \bar{x} )</th>
<th>S</th>
<th>( S^2 )</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Items</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSD</td>
<td>2.78</td>
<td>1.38</td>
<td>1.90</td>
<td>0.41</td>
<td>7.54</td>
<td>6</td>
<td>153</td>
</tr>
<tr>
<td>CSD</td>
<td>2.55</td>
<td>1.69</td>
<td>2.84</td>
<td>0.43</td>
<td>7.33</td>
<td>4</td>
<td>153</td>
</tr>
<tr>
<td>ISD</td>
<td>2.42</td>
<td>1.62</td>
<td>2.61</td>
<td>0.47</td>
<td>7.54</td>
<td>3</td>
<td>153</td>
</tr>
<tr>
<td>ASD</td>
<td>3.80</td>
<td>1.65</td>
<td>2.73</td>
<td>0.45</td>
<td>7.84</td>
<td>5</td>
<td>153</td>
</tr>
<tr>
<td>DSD</td>
<td>1.60</td>
<td>1.12</td>
<td>1.26</td>
<td>0.47</td>
<td>7.54</td>
<td>3</td>
<td>153</td>
</tr>
</tbody>
</table>

Treating each construct separately, items belonging to a scale are regressed on the independent variable representing standard deviations of items belonging to that scale. To form
corrected scale scores from the linear regression model, the equation

\[ \hat{y}_{ijk} = \beta_{0_{jk}} + \beta_{1_{jk}} x_j \]

was used to generate predicted values of the cluster-specific items. Taking residuals as a function of

\[ e_{ijk} = y_{ijk} - \hat{y}_{ijk} \]

gives estimates of scale-item values which have been corrected for response set. Item values, after correction, represent the proportion of an individual's scale score which is not predictable from knowledge of his response variability across items associated with a given construct. Distribution characteristics of corrected item scores associated with their respective scale clusters are shown in Table 6.

Table 6. Distribution characteristics of scale item statistics based on measurement correction for response set

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Item means</th>
<th>Item variances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \bar{x} )</td>
<td>( S^2 )</td>
</tr>
<tr>
<td>Traditionalism</td>
<td>4.75 5.39 6.57</td>
<td>10.67 2.03 4.44</td>
</tr>
<tr>
<td>Control</td>
<td>-0.97 5.86 5.25</td>
<td>8.99 7.68 6.59</td>
</tr>
<tr>
<td>Individualism</td>
<td>-0.21 1.86 2.72</td>
<td>13.84 13.34 7.15</td>
</tr>
<tr>
<td>Directing</td>
<td>-1.00 2.50 2.91</td>
<td>5.78 0.89 1.71</td>
</tr>
</tbody>
</table>
Corrected scale items are aggregated within clusters using the model provided by the Summated Ratings scaling technique. This method assumes that the summated scale total score is a linear, additive combination of its components. Distribution characteristics of scale composites formed under this model are shown in Table 7.

Table 7. Distribution characteristics of composite scale values based on measurement correction for response set

<table>
<thead>
<tr>
<th>Attitude scale</th>
<th>( \bar{x} )</th>
<th>S</th>
<th>( S^2 )</th>
<th>Range</th>
<th>Number of items</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditionalism</td>
<td>4.75</td>
<td>13.28</td>
<td>176.38</td>
<td>78.00</td>
<td>6</td>
<td>153</td>
</tr>
<tr>
<td>Control</td>
<td>-3.89</td>
<td>8.16</td>
<td>66.63</td>
<td>39.69</td>
<td>4</td>
<td>153</td>
</tr>
<tr>
<td>Individualism</td>
<td>-0.64</td>
<td>7.87</td>
<td>61.97</td>
<td>45.22</td>
<td>3</td>
<td>153</td>
</tr>
<tr>
<td>Activity</td>
<td>-9.16</td>
<td>9.42</td>
<td>88.68</td>
<td>59.13</td>
<td>5</td>
<td>153</td>
</tr>
<tr>
<td>Directing</td>
<td>-2.99</td>
<td>5.49</td>
<td>30.15</td>
<td>24.02</td>
<td>3</td>
<td>153</td>
</tr>
</tbody>
</table>

A cursory comparison of Tables 2 and 7 suggest that little change has taken place in the composite scale indices. Although there has been a radical shift in scale means, this is of little consequence since the scale for measuring attitudes was arbitrary to begin with. More importantly, the variance of the corrected composites is slightly smaller than the variance of the uncorrected composites. When viewed superficially, this may be taken to imply that the effect of
removing response set is a liability: larger scale variance is almost always preferable to smaller scale variance.

The variance of a composite, however, is the sum of item variances and inter-item covariances. A comparison of the average variances of scale items before and after applying the response set correction, as shown in Tables 1 and 6, suggests that the relative weighting of these two components may have changed. The average of the corrected item variances in each cluster has been reduced, often substantially, from those in the uncorrected clusters. Furthermore, in all but one cluster, the dispersion of item variances is smaller in the corrected clusters than in their uncorrected counterparts.

While these are desirable results, their effect will be noticeable only if the proportion of item covariation in the scale increases, or at least remains the same, after the response set correction is applied to scale items. That is, it is desirable that the reduction in total scale variance be solely at the expense of item variance, and not item covariance. Evidence relating to these concerns will be surveyed in the subsequent chapter.
CHAPTER 6. ANALYSIS AND FINDINGS

The analysis of data and discussion of findings are presented in three sections. The first section examines the effect of response set correction on properties of scales which have been constructed using the five item clusters discussed previously. Scale properties are determined twice: first on the data before it is corrected for response set, and secondly after the response set correction has been applied. Discussion is limited to a comparative evaluation of the degree to which uncorrected and corrected scale properties approach "ideal" characteristics.

A test of assumptions underlying the use of moderator variables constitutes the focus of the second section of findings. Of primary interest is the assumption that moderator or intervening variables are unrelated to antecedent variables. Antecedent variables are attitude scales; the moderator effect is the joint measure of organization size and prior management experience. Evidence for a test of the assumption of independence is presented.

The third section involves an evaluation of the effect of managers' attitudes on managers' performance. The relationship is further specified by the use of moderator effects: analysis is conducted within each of the distinct sub-groups defined by the moderator variable. Comparisons are made between uncorrected and corrected attitude scales with respect
to their degree of association with measures of managerial behavior and managerial role performance.

Comparisons of Corrected and Uncorrected Scales

Five properties of scales, additivity, homogeneity of item variances, symmetry of covariance matrices, estimates of reliability, and orthogonality of scale dimensions, constitute the bases for comparison among scales. The effect of removing response set from a scale will be examined in terms of changes in the magnitude of coefficients representing these scale properties. Where a single coefficient is not sufficient, a multivariate comparison will be made using conventional statistical tests of significance for evaluating departure from expected values under null conditions.

Additivity

The first scale property to be examined, additivity, constitutes a fundamental assumption of Summated Ratings scales. In sociological terms, additivity implies that the ordering of items in terms of extremes in content or phraseology will be preserved for every respondent in the sample. Furthermore, it is assumed that scale intervals between successive items will be constant. For example, if one respondent assigns a scale value of three to the first item in an ordered set, and the interval between each element was known to be a scale value of two, then the scale score of the second and successive elements
would be five, seven, nine, and successive odd integers up to the upper limit of the response continuum. This argument is also valid for the proportional interval case where intervals are some function of a constant multiplier.

The effect of nonadditivity is seen in cases where the interval between successive elements in an ordered set varies among subjects. The important consideration is that scale intervals are not equal or proportional across all subjects in the sample. This suggests that some members of the population tend to react to the scale differently than others. The result is a severe loss of generality of the scale across elements of a population.

Tuckey's test of additivity is a method for assessing the departure from the assumed conditions of scale-item additivity. The test employs residual variation associated with a Randomized Block analysis of variance design. Within blocks (persons) variation is decomposed into variation between treatments (items) and residual variation. Residual variation is further decomposed into variation due to nonadditivity, or block-treatment interaction and error variation.

The test for nonadditivity is the ratio of

\[
\frac{MS_{\text{nonadditivity}}}{MS_{\text{error}}}
\]

with degrees of freedom equal to one for nonadditivity, and \((k-1)(N-1)-1\) degrees of freedom for error. K represents the
number of treatments, and \( N \) represents the number of subjects. The above ratio is distributed as \( F \) with 1 and \((k-1)(N-1)-1\) degrees of freedom.

Tables 8a and 8b show nonadditivity F-ratios for uncorrected and corrected attitude scales. A comparison of the ratios among the uncorrected scales shows that in only two scales, Traditionalism and Individualism, nonadditivity is not a significant factor. In the three remaining scales, the effect of nonadditivity is significant at the .01 level. Comparing the F-ratios among scales which have been corrected for response set indicates that only one of the five scales exhibits block-treatment interaction. Departure from the assumption of nonadditivity in the scale Directing is significant at the .025 level.

A comparison of F-ratios among corrected and uncorrected scales shows that in only one scale, Traditionalism, was the size of the ratio increased, and even then only by a trivial amount. In all other scales, the magnitudes of the ratio were substantially lowered after employing the response set correction.

Another method by which the degree of nonadditivity is assessed is by calculating the Tuckey estimate of the power to which items must be raised to achieve additivity. The coefficient may be applied in a power transformation, in the form of \( Y = X^p \), on the original data items. When the power is greater than or less than one, Snedecor and Cochran (1967:331)
Table 8a. Characteristics of attitude scale composites based on uncorrected item scores

<table>
<thead>
<tr>
<th>Type of scale evaluation</th>
<th>Traditionalism</th>
<th>Attitude scales</th>
<th>Activity</th>
<th>Directing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Randomized block ANOVA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between subjects</td>
<td>2.66**</td>
<td>1.47**</td>
<td>1.64**</td>
<td>0.97</td>
</tr>
<tr>
<td>Between items</td>
<td>65.04**</td>
<td>59.25**</td>
<td>20.21**</td>
<td>140.72**</td>
</tr>
<tr>
<td>D.F.: num./denom.</td>
<td>(5,760)</td>
<td>(3,456)</td>
<td>(2,304)</td>
<td>(4,608)</td>
</tr>
<tr>
<td>Nonadditivity</td>
<td>0.54</td>
<td>18.28**</td>
<td>0.87</td>
<td>20.61**</td>
</tr>
<tr>
<td>D.F.: num./denom.</td>
<td>(1,759)</td>
<td>(1,455)</td>
<td>(1,303)</td>
<td>(1,607)</td>
</tr>
</tbody>
</table>

| Reliability coefficients |                |                |          |           |
| α-unstandardized         | .736           | .509           | .457     | .464      | .561      |
| α-standardized           | .741           | .554           | .457     | .464      | .577      |
| α_s - α_U                | .005           | .045           | .00      | .00       | .016      |
| Additivity transform Y = X^p | 1.164       | 2.542          | .590     | 2.02      | 6.14      |

* Significant at the .05 level.

** Significant at the .01 level.
observe that the necessity for a transformation may be signaled. For example, a power estimate of two implies that additivity can be achieved by taking the square of the observed item values. Similarly, a power estimate of one-half indicates that a square-root transformation is appropriate.

An examination of power estimates in Table 8a shows that appropriate transformations range from a square-root for items in the Individualism scale to raising items to the power six in the scale, Directing. Only one of the five scales, Traditionalism, does not appear to exhibit a pronounced degree of nonadditivity. A comparison of power estimates to the size of nonadditivity F-ratios associated with the scales indicates that while the square-root transformation would be appropriate for the scale Individualism, it is not necessary since block-treatment interaction is nonsignificant.

The results from calculating the Tuckey estimates on the corrected scale items are given in Table 8b. Four of the five coefficients have values close to one, an optimum value indicating complete additivity among scale items. Among the coefficients based on corrected scales, the largest deviation from the optimum value is .916, a difference of only .084, while among the uncorrected scales, the smallest deviation from the optimum value shows a difference of .164.

Comparison of the same scales before and after correction for response set with respect to estimates of nonadditivity
Table 8b. Characteristics of attitude scale composites based on corrected item scores

<table>
<thead>
<tr>
<th>Type of scale evaluation</th>
<th>Traditionalism</th>
<th>Attitude scales</th>
<th>Activity</th>
<th>Directing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>Individualism</td>
<td></td>
</tr>
<tr>
<td>Randomized block ANOV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between subjects</td>
<td>2.40**</td>
<td>1.36*</td>
<td>1.69**</td>
<td>.78</td>
</tr>
<tr>
<td>Between items</td>
<td>119.09**</td>
<td>139.40**</td>
<td>27.31**</td>
<td>256.01**</td>
</tr>
<tr>
<td>D.F.: num./denom.</td>
<td>(5,760)</td>
<td>(3,456)</td>
<td>(2,304)</td>
<td>(4,608)</td>
</tr>
<tr>
<td>Nonadditivity</td>
<td>1.17</td>
<td>0.85</td>
<td>0.36</td>
<td>0.55</td>
</tr>
<tr>
<td>D.F.: num./denom.</td>
<td>(1,759)</td>
<td>(1,455)</td>
<td>(1,303)</td>
<td>(1,607)</td>
</tr>
<tr>
<td>Reliability coefficients</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>α-unstandardized</td>
<td>.766</td>
<td>.614</td>
<td>.495</td>
<td>.520</td>
</tr>
<tr>
<td>α-standardized</td>
<td>.768</td>
<td>.647</td>
<td>.502</td>
<td>.532</td>
</tr>
<tr>
<td>α_U - α_S</td>
<td>.003</td>
<td>.033</td>
<td>.007</td>
<td>.012</td>
</tr>
<tr>
<td>Additivity transform Y = X^P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tukey power estimate</td>
<td>1.016</td>
<td>.978</td>
<td>1.007</td>
<td>1.023</td>
</tr>
</tbody>
</table>

* Significant at the .05 level.
** Significant at the .01 level.
indicates that the correction yields superior results, and in fact induces almost complete conformance to this assumption of the Summated Ratings measurement model.

**Homogeneity of variances**

Another basis for evaluating items to be included in a scale is in terms of the homogeneity of their variances. A standard test in this case is Hartley's F-Max which is the ratio of the largest item variance to the smallest item variance.

Homogeneity of variances is another assumption of the Domain Sampling model. Within any field of content it is expected that under actual sampling conditions some items at the extremes of the range would be selected. The easiest case to visualize is that in which items required a yes-no dichotomous response. Under the Domain Sampling model items with a fifty-fifty or sixty-forty agree-disagree split would be expected to occur more frequently than items with an eighty-twenty or ninety-ten split.

In order to maximize the variance of an entire test, item variances should be large and homogeneous. Sharp departures from homogeneity among item variances will tend to attenuate the magnitude of covariances among scale items to an even larger degree, thus reducing the most important component of scale total variance. Maximum variance can be achieved by
ensuring that all items contribute an approximately equal amount of variance and covariance to the scale total. Otherwise the construct would not appear to be well represented in the item domain.

Table 9 shows the comparisons of the F-Max ratio applied to uncorrected and corrected item variances, as well as the percentage points at the .95 probability level. It is seen that in two scales, Traditionalism and Individualism, the variance ratio has been increased slightly although they are still within the 95% confidence interval. For the scales Control and Activity, the ratios of the corrected items are significantly different from one. However, the ratios appear to have been reduced substantially when they are compared to their uncorrected counterparts. The ratio for the corrected items associated with the scale Directing, has become non-significant.

It appears that correcting item values for response set has only a marginal effect on item variances. If the ratio of the maximum to minimum item variance was small to begin with, it tended to remain small after response correction was applied. If the ratio was moderately large in the uncorrected scale, then the reduction due to response set correction is not sufficiently great for the conclusion to be made that the correction procedure induced homogeneity among scale-item variances.
Table 9. Variance ratios\(^a\) (largest \(\hat{\sigma}^2\)/smallest \(\hat{\sigma}^2\)) for uncorrected and corrected attitude scale composites

<table>
<thead>
<tr>
<th>Attitude scale</th>
<th>Scale items</th>
<th>(\alpha = .05^b)</th>
<th>Number of (\hat{\sigma}^2_j)</th>
<th>D.F. for (\hat{\sigma}^2_j)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uncorrected</td>
<td>Corrected</td>
<td>Percentage point</td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>1.438</td>
<td>1.536</td>
<td>2.11</td>
<td>6</td>
</tr>
<tr>
<td>Control</td>
<td>2.893</td>
<td>2.082</td>
<td>1.96</td>
<td>4</td>
</tr>
<tr>
<td>Individualism</td>
<td>1.505</td>
<td>1.670</td>
<td>1.85</td>
<td>3</td>
</tr>
<tr>
<td>Activity</td>
<td>3.301</td>
<td>2.666</td>
<td>2.04</td>
<td>5</td>
</tr>
<tr>
<td>Directing</td>
<td>2.072</td>
<td>1.331</td>
<td>1.85</td>
<td>3</td>
</tr>
</tbody>
</table>

\(^a\)Hartley's \(F_{\text{max}}\) statistic: \(F_{\text{max}} = (\hat{\sigma}^2 \text{ largest})/(\hat{\sigma}^2 \text{ smallest})\).

\(^b\)Percentage points taken from Table C.7 in Winer (1971) using D.F. \(\hat{\sigma}^2_j = 60\).
Symmetry of covariance matrices

A further assumption of the measurement model, compound symmetry of the scale-item covariance matrix, is rigorous and seldom tested in practice. In fact, compound symmetry in covariance matrices depends upon an extension of the rationale employed to justify the requirement that scale-item variances be approximately equal in magnitude.

In the Randomized Block design discussed previously, this implies that the covariances among items or treatments should be of the same magnitude. It is further assumed that variances of items are homogeneous. Under these assumptions, the variance-covariance matrix will have compound symmetry (Winer, 1971:596). A matrix with compound symmetry has the following form:

$$
\Sigma = \begin{bmatrix}
\sigma^2 & \rho\sigma^2 & \rho\sigma^2 \\
\rho\sigma^2 & \sigma^2 & \rho\sigma^2 \\
\rho\sigma^2 & \rho\sigma^2 & \sigma^2
\end{bmatrix}
$$

An unbiased estimate of $\Sigma$ is provided by the matrix $S_0$ with sample estimates of average variances on the diagonal and average covariances on the off-diagonals. This matrix has the form:
where $s^2$ is the average of the individual item variances, and $rs^2$ is the average of inter-item covariances.

$S_0$ constitutes the hypothesis matrix against which the sample dispersion matrix will be tested. In Winer's (1971) terminology, $S_0$ represents the constrained covariance matrix, $S$, the original sample covariance matrix, represents the unconstrained covariance matrix. The object of the test is to determine how closely $S$ is approximated by $S_0$.

Winer (1971:595-96) suggests that under the hypothesis of equality of matrices, the test statistic

$$
\chi^2_f = (1-C_2) M_2
$$

approximates a Chi-Square distribution with $f_2$ degrees of freedom.

To calculate the coefficients $M_2$, $C_2$, and $f_2$ as they apply to the Randomized Block design, the following definitions are given.

N: total number of blocks (subjects).

p: number of replications per block.

q: number of treatments per block (items).
The remaining coefficients are calculated as follows:

\[ M_2 = -(N-p) \times (\ln|S|-\ln|S_0|) \]

\[ C_2 = \frac{q(q+1)^2(2q-3)}{6(N-p)(q-1)(q^2+q-4)} \]

\[ f_2 = \frac{q^2 + q - 4}{2} \]

For the data used in this study the coefficients \( N \) and \( p \) are constant for all scale clusters with values of 153 and 1 respectively. \( q \) represents the number of items in a scale cluster. Applying these formulas to the uncorrected and corrected values for items in each of the five clusters yielded the results shown in Table 10.

Table 10. Chi-Square values for a test of compound symmetry on attitude scale item-covariance matrices

<table>
<thead>
<tr>
<th>Attitude scale</th>
<th>Uncorrected</th>
<th>Corrected</th>
<th>( \chi^2_{.05} )</th>
<th>D.F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditionalism</td>
<td>45.07</td>
<td>50.46</td>
<td>30.1</td>
<td>19</td>
</tr>
<tr>
<td>Control</td>
<td>75.54</td>
<td>77.10</td>
<td>15.5</td>
<td>8</td>
</tr>
<tr>
<td>Individualism</td>
<td>8.70</td>
<td>12.48</td>
<td>9.5</td>
<td>4</td>
</tr>
<tr>
<td>Activity</td>
<td>66.10</td>
<td>70.19</td>
<td>22.4</td>
<td>13</td>
</tr>
<tr>
<td>Directing</td>
<td>34.31</td>
<td>5.66</td>
<td>9.5</td>
<td>4</td>
</tr>
</tbody>
</table>
The columns labeled "Uncorrected" and "Corrected" contain the calculated Chi-Square coefficients for each of the scales. These may be compared to the Chi-Square percentage point at the .95 probability level with the degrees of freedom in the adjacent column. An overall comparison suggests that the assumption of compound symmetry is even less tenable for the corrected scales than it is for the uncorrected scales.

For the scale, Individualism, response set correction increased the Chi-Square value from a nonsignificant to a significant level. The reverse result was seen in the case of the scale Directing. In the remaining three scales, the Chi-Square was significant both before and after correction for response set was applied.

On the whole, the correction for response set may be judged to have no effect, or at worst, a slightly adverse effect on compound symmetry of the scale-item covariance matrices. An important consideration, however, is that the increases in the values of the Chi-Square coefficients were only marginal in four of the five scales. For the Directing scale, the reduction in the magnitude of Chi-Square is large with the percentage point for the Chi-Square value changing to nonsignificance.

Estimates of scale reliability

A widely used estimate for the proportion of true-score variance in a scale total score is Cronbach's coefficient Alpha.
The definitional formula for Alpha is

\[ \text{Alpha} = \frac{K}{K-1} \left( 1 - \frac{\sum \sigma_i^2}{\sigma_T^2} \right) \]

where \( K \) represents the number of items in a scale cluster, \( \sigma_i^2 \) are cluster item variances, and \( \sigma_T^2 \) is the variance of the scale total score.

An estimate of the proportion of true-score variance in a scale may also be obtained from the variance components associated with the application of the Randomized Block design to the basic data. The following results have been shown to yield estimates which are equivalent to Cronbach's Alpha.

\[ \text{Alpha} = 1 - \frac{\text{MS}_{\text{residual}}}{\text{MS}_{\text{blocks}}} = \frac{\text{MS}_{\text{blocks}} - \text{MS}_{\text{error}}}{\text{MS}_{\text{blocks}}} \]

It follows that reliability, defined as the proportion of true-score variance in a test, will automatically be increased when either (1) variation between blocks is increased relative to error variance, or (2) variation among treatments within blocks is increased relative to error variance.

F-ratios (between Items/Residual) shown in Tables 8a and 8b, along with the unstandardized coefficient Alpha support this conclusion. With the exception of the corrected scale Directing, which has a ratio five times larger than its uncorrected counterpart, the ratios of item mean-square to
residual mean-square are almost twice as large in the scales corrected for response set compared to the uncorrected scales. By allowing item means to vary freely, while at the same time maintaining or increasing the homogeneity of item variances, a closer approximation to true content dispersion along a continuum has been achieved. This continuum is one on which items would be scaled relative to their degree of affectivity.

The effect of reducing item nonadditivity and adjusting item means has resulted in a decrease in the item variances relative to scale-total variance. The single indicators which reflect the changes in proportions of types of scale variation are the reliability coefficients for uncorrected and corrected scales. Two scales which have been little affected are Traditionalism and Individualism. The remaining three scales have shown considerable improvement in their reliabilities.

Another point of comparison that may be made is the effect on reliability of standardizing the scale covariance matrix. If the matrix is relatively homogeneous, the transformation will have little effect on the magnitude of the reliability coefficient. Coefficient Alpha based on the standardized matrix will never be lower than the coefficient calculated on the raw covariances. It is seen that the best scales have the most homogeneous matrices as is the case with Traditionalism and Individualism. Scales Control, Activity, and Directing have benefited most from standardization.
Another factor that must be considered in assessing scale reliability is the effect of nonadditivity. It will be recalled that $MS_{error}$ in the variance ratio used to estimate this coefficient is in fact unbiased only when the nonadditivity assumption is supported. Otherwise, block-treatment interaction may inflate the value of this estimate. The result is that when there is nonadditivity among scale item $MS_{error}$ is larger than it should be and the reliability of the scale is decreased.

The effect is more serious than just reducing the value of the reliability coefficient because it means that subject-item interaction restricts the generalizability of the scale to other populations. The alternatives are to incorporate the subject-item interaction as a meaningful component of response, or to remove it, as has been done in this study, under the assumption that it constitutes a nongeneralizable effect of personality.

**Scale orthogonality**

A desirable property of a scale total score is that its association with a criterion variable be independent of other scale total scores employed in a prediction model. Consequently, a desirable property of a transformation applied to these scales is that the degree of orthogonality which was present among the original scales be preserved.
As a basis for this expectation, it will be recalled that the response set coefficients on which the corrections were based are estimated individually for each scale. It is anticipated that the content of each scale will generate differing degrees of ego involvement, leading to different degrees of response set. If a pooled estimate of response set, based on all items in the five scale clusters is used, then the expected value of each of the items would be some function of items in all clusters combined. This common component would be reflected in relationships among the individual scale total scores.

Table 11a. Correlation matrix of attitude scales based on uncorrected scale item values

<table>
<thead>
<tr>
<th>Attitude scale</th>
<th>Zero-order correlation coefficients (n=153)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>-0.0745</td>
<td>-</td>
</tr>
<tr>
<td>Individualism</td>
<td>-0.1047</td>
<td>0.0143</td>
</tr>
<tr>
<td>Activity</td>
<td>0.4503**</td>
<td>-0.0364</td>
</tr>
<tr>
<td>Directing</td>
<td>0.1342*</td>
<td>0.2196**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.1880**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1982**</td>
</tr>
</tbody>
</table>

*Significant at the .05 level.

**Significant at the .01 level.
Table 11a contains the product-moment correlations among the Summated Ratings scales before the scales have been corrected for response set. In view of the fact that the scales were not based on factor score coefficients derived from a linear regression of items on their respective factors, the degree of orthogonality is rather good. Traditionalism and Activity scales show the greatest amount of interdependence with a correlation coefficient of .45. Directing is associated with all scales, but in moderate degree, although the correlation coefficients are all significant at the .05 level.

When the scale total scores are used in a multiple regression model, orthogonality implies that each scale will be allowed to contribute a unique portion of variance. Thus inferences may be made with respect to the utility of each scale in reducing the unexplained variance in the dependent variable.

Correlations among the corrected scale totals are shown in Table 11b. The pattern indicates that the original dispersion matrix has been fairly well-preserved. The largest correlation has been reduced from .45 to .39, while the correlations among Directing and the remaining four scales have been moderately increased. All correlations that are statistically significant at the .05 level in the correlation matrix based on corrected scales were also significant in the matrix of uncorrected scales. Minor sign changes have occurred among
Table 11b. Correlation matrix of attitude scales based on corrected scale item values

<table>
<thead>
<tr>
<th>Attitude scale</th>
<th>Zero-order correlation coefficients (n=153)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditionalism</td>
<td>-</td>
</tr>
<tr>
<td>Control</td>
<td>0.0498</td>
</tr>
<tr>
<td>Individualism</td>
<td>-0.1063 -0.0183</td>
</tr>
<tr>
<td>Activity</td>
<td>0.3926** 0.1008 -0.0185</td>
</tr>
<tr>
<td>Directing</td>
<td>0.1907** 0.3133** -0.2151** 0.2905** -</td>
</tr>
</tbody>
</table>

* Significant at the .05 level.
** Significant at the .01 level.

correlations that were near zero. It is seen that applying the response set correction does not materially affect the relationships among the scale.

Summary of scale properties

The correction for response set was found to virtually eliminate variance due to nonadditivity in all scale-item clusters. The consequence of induced additivity is a better approximation to the assumptions of the Summated Ratings model, and a greater degree of generalizability to the respondent population.

There was a tendency for scale variances to be homogenized after the correction for response set was applied. In the
uncorrected scales, three of the five scales exhibited a degree of nonhomogeneity which was significant at the .05 level using Hartley's F-max test. After applying the response set correction two of the five scales showed significant amounts of nonhomogeneity. The size of variance ratios used in the F-max statistic were generally smaller in the corrected scales.

The test for compound symmetry of the scale covariance matrices showed mixed results. In both corrected and uncorrected scales, three of the five scales exhibited asymmetry. One scale was changed from symmetric to asymmetric by the correction technique. Another scale met the assumption of symmetry after correction, but not before.

Scale reliability, measured by Cronbach's Alpha, was increased for all scales after they were corrected for response set. In scales which initially had moderately high reliability, there was little change in the Alpha values. The greatest increases were seen in scales which initially had low reliabilities. The average increase in reliability in the latter group of scales was .069, while scales with moderately high reliabilities saw an increase of about .034. The differences between standardized and unstandardized reliabilities was, on the average, slightly decreased for scales which has been corrected for response set.

The dispersion matrix among scales before the response set correction was applied showed that only one scale,
Directing, was significantly correlated with the remaining four scales, and that the Traditionalism scale was moderately correlated with the Activity scale. After correcting for response set, the pattern of correlations remained substantially the same. This indicates that inferences about the relationships among scales would not be affected by the correction technique.

Moderator Effects

In this study moderator variables play the important role of specifying conditions under which the relationships among attitudes and behaviors are likely to be enhanced or inhibited. Previous research has suggested that organization administrators who have previously held high-ranking administrative positions in other organizations may tend to develop a point of view which might be contrary to prevailing norms in the host organization. Because these individuals may have been retained for the purpose of improving a record of poor organizational performance, the administrator is frequently able to impose his point of view on both organizational structure and policies. Thus there are sufficient reasons to believe that attitudes of administrators who have more varied experiences are likely to be more instrumental in affecting a manager's behavior than are attitudes of those managers who have "developed" within a single organizational environment.
The size of the organization may, on the other hand, promote or inhibit the influence of managerial attitudes upon role behaviors and organizational structure. In small organizations an immediate constraint on the effectiveness of managerial performance is the amount of organization resources that can be allocated to a given program. The lack of resources may inhibit the effectiveness of performance in spite of adequate management motivation. Conversely, large organizations, possessing more levels of authority, may incorporate programs which indicate a high level of managerial role performance. The programs, however, may be only tenuously connected with the point of view held by top administrators. Both large and small organizations may possess a form of built-in inertia realized through structure and policies which may mitigate the effect of management attitudes.

An important aspect of this study involves the evaluation of the joint effects of prior management experience and organization size upon the relationships among attitudes and behavior. A key assumption about the operating characteristics of moderator variables is that they are unrelated to independent variables used in a linear model. A sufficient test of this assumption may be had by evaluating measures of association among moderator and predictor variables. Where both the moderator and predictor variables are continuous, a correlation coefficient would constitute an adequate measure. When the
moderator variable is based on nominal levels of measurement and the predictor variable is continuous a single classification analysis of variance may be employed.

The groups previously described in Table 4 consist of managers who have the following characteristics: (1) low job mobility, located in small firms, (2) low job mobility, located in large firms. The results of analyzing differences among groups with respect to each of the five attitude scales in a single-classification analysis of variance model is presented in Table 12a. Since the groups have been defined, rather than sampled from some population, a fixed-effects model is appropriate for this analysis. F-ratios in each scale are distributed with three degrees of freedom in the numerator and one hundred forty-nine degrees of freedom in the denominator.

Table 12a. One-way ANOV examining overall differences in mean attitude scores among managers for all levels of the moderator variable

<table>
<thead>
<tr>
<th>Attitude scale</th>
<th>Uncorrected scales</th>
<th>Corrected scales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F-Ratio</td>
<td>Prob. &gt; F</td>
</tr>
<tr>
<td>Traditionalism</td>
<td>0.375</td>
<td>0.688</td>
</tr>
<tr>
<td>Control</td>
<td>2.387</td>
<td>0.070</td>
</tr>
<tr>
<td>Individualism</td>
<td>0.232</td>
<td>0.593</td>
</tr>
<tr>
<td>Activity</td>
<td>1.106</td>
<td>0.349</td>
</tr>
<tr>
<td>Directing</td>
<td>0.661</td>
<td>0.578</td>
</tr>
</tbody>
</table>

*All F-ratios calculated with 3 D.F. in the numerator and 149 D.F. in the denominator.*
The F-probabilities for the five corrected scales indicate that the condition that a moderator variable be unrelated to predictor variables is fairly well met. Only one scale, Control, shows a statistically significant difference at the .05 level.

A more detailed analysis among groups, shown in Table 12b, indicates that the pairwise differences contributing most heavily to the overall differences among the four group means occurred between groups three and four, and groups two and four. An identical analysis performed on the uncorrected scales shows similar patterns in the F-ratios, an exception being that the F-probability for the scale Control is small, but not statistically significant.

It may then be concluded that, overall, the assumptions with regard to moderator variables have been met. With only one exception, group membership is unrelated to level of attitude.

Attitude-Behavior Relationships

The investigation of attitude-behavior relationships serves a twofold purpose in this study. The first objective is to determine whether the attitude scales, developed previously, are related to behavior of management personnel in their organizational environment. More specifically, the focus is upon managerial attitudes and their relationship to
<table>
<thead>
<tr>
<th>Attitude scales</th>
<th>Low vs. high job mobility</th>
<th>Small vs. large organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T-value</td>
<td>Prob. &gt; T</td>
</tr>
<tr>
<td><strong>Uncorrected scales</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>-0.135</td>
<td>0.892</td>
</tr>
<tr>
<td>Control</td>
<td>1.990</td>
<td>0.048</td>
</tr>
<tr>
<td>Individualism</td>
<td>-0.319</td>
<td>0.750</td>
</tr>
<tr>
<td>Activity</td>
<td>-0.593</td>
<td>0.554</td>
</tr>
<tr>
<td>Directing</td>
<td>1.317</td>
<td>0.190</td>
</tr>
<tr>
<td><strong>Corrected scales</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>-0.149</td>
<td>0.882</td>
</tr>
<tr>
<td>Control</td>
<td>2.107</td>
<td>0.037</td>
</tr>
<tr>
<td>Individualism</td>
<td>-0.338</td>
<td>0.736</td>
</tr>
<tr>
<td>Activity</td>
<td>-0.952</td>
<td>0.343</td>
</tr>
<tr>
<td>Directing</td>
<td>0.982</td>
<td>0.328</td>
</tr>
</tbody>
</table>

\(^a\)All *t*-tests were based on a pooled estimate of variance.
the effectiveness of manager performance. Management performance can be described in two ways. One perspective incorporates, as representative of performance, those activities and programs which are a direct outcome of decision-making processes. From a second perspective, managerial performance may be seen as role behaviors which may be a consequence of not only management attitudes, but many other organizational factors. The second objective of the study is to determine whether the removal of bias due to response set in scale items has an effect on measures of association between attitude scales and indicators of management performance.

The following section will be concerned with evaluating the degree of association among attitudes and behaviors. Constraints, in the form of the moderator effects, organization size and job mobility, will then be introduced to specify the conditions under which the strength of relationships are enhanced or diminished. In addition, a comparison will be made between the relative effectiveness of attitude measures corrected for response set and their uncorrected counterparts.

Zero-order correlations are used as a measure of the degree of association between attitude scales and measures of management performance. Comparisons will be limited to pointing out differences in the relative magnitude of correlation coefficients between levels of the moderator variable. Multivariate tests of the equivalence of covariance or correlation
matrices have not been used in this portion of the study. The main interest is in incremental changes in measures of association calculated before and after attitude scales have been corrected for response set. Since no particular pattern of differences has been anticipated, and because many differences are likely to be slight since the original data are well conditioned, an omnibus test would be unlikely to serve a useful purpose. It is for these same reasons that tests of significance for differences among pairs of coefficients have been omitted.

When a causal framework is implied in an analysis procedure, Specht and Warren (1974) observe that comparison of coefficients from within-group correlation matrices is not recommended if the variances of the dependent variables are not homogeneous among groups. The lack of homogeneous variances can yield within-group correlations which are numerically equivalent for two or more groups. The similar correlations, however, may depend upon completely different structural parameters in their respective populations. This result is a consequence of the fact that the correlation coefficient may be defined as $r_{xy} = (b_{xy} \cdot b_{yx})^{1/2}$ where $r_{xy}$ would retain the same value even if the values of the slopes were interchanged.

To the extent that the assumption of homogeneous variances of the dependent variable is tenable, point for point
comparison of correlation coefficients in different groups will lead to valid inferences about differences in covariances. The inference will, in fact, be the same if slope coefficients had been used rather than correlations.

Evidence which supports the use of correlation coefficients as a valid basis for making comparisons among groups is given in Table 13. All variables shown in this table are used in between-group comparisons. The $C_{\text{max}}$ statistic, as it is used here, is an index of the homogeneity of a variable's variance across the four groups defined by the moderator variable. Among the fourteen variables shown, only Staffing, Control (uncorrected), and Activity (corrected) show evidence of non-homogeneous variances. However, none are sufficiently heterogeneous to reject an hypothesis of homogeneity at the .05 level of significance. Consequently, inferences about the strength of attitude-behavior relationships and the utility of response set correction will not be invalidated by a violation of this assumption.

Attitudes and role performance

Role performance is a composite variable which represents the organizational utility of management decisions involving the establishment of policies and programs for firm operations. As the number of programs and activities with high utility increases the effectiveness of role performance may be said to increase. Subsequent discussion will focus on the relationship
Table 13. Percentage points of Cochran's $C_{max}$ statistic calculated on estimates of within-group variance for managerial performance variables and attitude variables for each level of the moderator variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cochran's $C_{max}$ statistic$^a$</th>
<th>Percentage point</th>
<th>Approx. prob. &gt; $C_{max}$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Managerial performance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role performance</td>
<td>0.3367</td>
<td>0.146</td>
<td></td>
</tr>
<tr>
<td>Directing</td>
<td>0.2800</td>
<td>0.798</td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td>0.3369</td>
<td>0.144</td>
<td></td>
</tr>
<tr>
<td>Staffing</td>
<td>0.3459</td>
<td>0.102</td>
<td></td>
</tr>
<tr>
<td><strong>Uncorrected scales</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>0.2741</td>
<td>0.912</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>0.3452</td>
<td>0.105</td>
<td></td>
</tr>
<tr>
<td>Individualism</td>
<td>0.3073</td>
<td>0.389</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>0.3191</td>
<td>0.268</td>
<td></td>
</tr>
<tr>
<td>Directing</td>
<td>0.2675</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td><strong>Corrected scales</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>0.2895</td>
<td>0.634</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>0.3131</td>
<td>0.326</td>
<td></td>
</tr>
<tr>
<td>Individualism</td>
<td>0.3083</td>
<td>0.377</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>0.3522</td>
<td>0.080</td>
<td></td>
</tr>
<tr>
<td>Directing</td>
<td>0.2723</td>
<td>0.947</td>
<td></td>
</tr>
</tbody>
</table>

$^a$Cochran's $C = (\text{maximum } \hat{\sigma}^2_j)/(\sum_{j=1}^{K} \hat{\sigma}^2_j); K = 4$ for all $C_{max}$. 
of the measured attitudes to this type of performance.

Traditional attitudes are those which lend support to established patterns of behavior, reliance on past experiences, and the use of "rules of thumb" as a basis for making decisions. Table 14 shows that the correlations between the scale, Traditionalism, and the role performance index are quite homogeneous for the total sample and all subgroups. Correlations are significant at the five percent level for the total sample and for groups one and two. The latter subgroups represent managers who have spent their entire managerial career in one organization. The remaining correlations, although of similar magnitude, are not significant due to the smaller sample sizes in these groups.

Scales corrected for response set show slightly higher correlations in the groups having mobile managers and among managers, in larger organizations, who have seen little inter-organizational mobility.

The consistent degree of association between Traditionalism and role performance may be a consequence of the homogeneity of the environment within which almost all cooperatives operate, regardless of size. Traditionalism may thus be considered to be a relatively ubiquitous orientation regardless of whether managers have gained experience in one or more firms, or whether they are employed in firms of differing size.
Table 14. Zero-order correlations, all attitude scales with variable role performance for total sample and all levels of moderator variable

<table>
<thead>
<tr>
<th>Attitude scale</th>
<th>Total (n=153)</th>
<th>Group 1 (n=46)</th>
<th>Group 2 (n=49)</th>
<th>Group 3 (n=32)</th>
<th>Group 4 (n=26)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uncorrected scales</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>.2695**</td>
<td>.3014*</td>
<td>.2453*</td>
<td>.2870</td>
<td>.2088</td>
</tr>
<tr>
<td>Control</td>
<td>.1083</td>
<td>-.0587</td>
<td>.3760**</td>
<td>.1128</td>
<td>-.1045</td>
</tr>
<tr>
<td>Individualism</td>
<td>-.0409</td>
<td>.2275</td>
<td>.1180</td>
<td>-.4749**</td>
<td>-.1735</td>
</tr>
<tr>
<td>Activity</td>
<td>.3091**</td>
<td>.1892</td>
<td>.5041**</td>
<td>.1228</td>
<td>.2964</td>
</tr>
<tr>
<td>Directing</td>
<td>.2002**</td>
<td>.0903</td>
<td>.3806**</td>
<td>.1905</td>
<td>.0131</td>
</tr>
<tr>
<td><strong>Corrected scales</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>.2656**</td>
<td>.2317</td>
<td>.2688*</td>
<td>.2921</td>
<td>.2432</td>
</tr>
<tr>
<td>Control</td>
<td>.1120</td>
<td>-.0555</td>
<td>.3760**</td>
<td>.1310</td>
<td>-.1035</td>
</tr>
<tr>
<td>Individualism</td>
<td>-.0417</td>
<td>.2243</td>
<td>.1267</td>
<td>-.4870**</td>
<td>-.1800</td>
</tr>
<tr>
<td>Activity</td>
<td>.2783**</td>
<td>.1772</td>
<td>.4599**</td>
<td>.1501</td>
<td>.2293</td>
</tr>
<tr>
<td>Directing</td>
<td>.1945**</td>
<td>.1315</td>
<td>.3324**</td>
<td>.1763</td>
<td>.0644</td>
</tr>
</tbody>
</table>

* Significant at the .05 level.

** Significant at the .01 level.
An orientation toward reducing uncertainty in planning is reflected by the attitude scale Control. If the reduction of uncertainty is valued by a manager then that manager will be inclined to make decisions that, for example, promote policies which emphasize the use of commodity markets as a hedge against inflation. Increased emphasis will be given to keeping abreast of local competitive practices, and any other sources of information which may aid short-term planning.

With respect to the total sample of managers, the Control scale did not appear to have a significant impact on the level of performance. The coefficients in Table 14 indicate that the lack of relationship in the total sample was, in part, a result of group effects cancelling each other. The only group in which the scale has a significant association with performance was in group two. Similar patterns of correlations are seen for both the uncorrected and corrected scale versions.

The fact that only one group showed a moderately strong relationship between the Control scale and performance may in part be due to two factors. First, a decision-maker must have a sound working knowledge of market areas, competitors, and other environmental constraints on his firm's operations. It is likely that the longer a manager has been employed by a given firm the greater will be his knowledge of these factors. Secondly, the decision-maker must have organization resources at his disposal in order to implement and maintain programs
which can minimize potentially disruptive effects of environment. Managers in large organizations generally have greater amounts and a wider variety of resources at their disposal.

Individualistic sentiments reflect the tendency of a manager to see himself relying upon his own knowledge and judgment, rather than that of subordinates, in making decisions. Individualistic attitudes may be used synonymously with inner-directedness as opposed to other-directedness.

With all subsamples combined, the relationship between individualistic attitudes and performance is statistically insignificant. When the moderator effects of mobility and organization size are considered, the interpretation is quite different. Managers with little diversity of management experience and who are employed in both small and large firms show small positive correlations between individualism and performance. A tentative explanation which may be advanced is that managers in these organizations have had time to structure decision-making procedures to suit their particular management style.

Conversely, managers who have moved into small firms must depend upon the cooperation of senior employees in order to become acquainted with existing informal norms, and because of potentially greater knowledge of clients possessed by these employees. The effect of such dependence is suggested by the relatively strong negative correlation between attitudes and
performance in group three. The smaller, but still negative, correlation for group four may indicate that while the same set of rules may prevail for socializing a manager, the effect is moderated by differences in organization structure that usually accompany changes in organization size.

The Activity scale is a measure of a manager's orientation toward involvement with operations of the organization as opposed to policy and planning activities. Overall, Activity-oriented attitudes reflect a management style which emphasized immediate solutions to symptoms rather than medium-range approaches to solving underlying problems. This scale has only a moderate correlation with the role performance index for the entire sample of managers. Table 14 indicates that among managers in group two the relationship is especially strong, and is significant at the one percent level despite the small sample size. A moderate, but nonsignificant, correlation is also observed in group four.

There appears to be a relationship, conditional on organization size, between a manager's willingness to become involved in day-to-day operations and the overall effectiveness of his role performance. No plausible interpretations for this relationship can be advanced at this time.

A comparison between the corrected and uncorrected scale shows that in general, the removal of response set has resulted in correlations which are consistently smaller in magnitude.
Attitudes toward employee direction and managers' role performance show a lack of relationship among managers who have experienced some degree of job mobility. Only managers in group two show consistently high relationships among these variables. When the total sample is analyzed, the correlation between attitudes toward employee direction and role performance is significant at the .01 level. However, this moderate correlation may be attributed primarily to the strong relationship shown for group two, and the absence of negative relationships in the remaining groups. Group two managers, because of their length of tenure in their organization and the size of the organization, may have an increased awareness of factors which motivate their own employees and may be able to allocate sufficient organizational resources to management tasks incorporated in the measure of role performance.

Overall, the effect of attitudes on role performance is not consistent. The motivation for placing attitudes and behavior in a context in which a relationship would be most likely to occur has had some support in a statistical sense, but not substantively. For the entire sample of managers, three of the five scales were correlated with performance at the one percent level of significance. However, the largest coefficient was on the order of .30. In terms of the proportion of variance in role performance explained by attitudes, it is still less than ten percent.
It appears that additional conditions are necessary to more completely specify the nature of relationships between attitudes and behavior. It has been suggested that, in the absence of adequate resources, positive attitudes toward management functions in a business will not yield effective levels of performance. The data also suggest that exposure of managers to a potentially wider range of stimuli may tend to weaken the link between attitudes and behavior. This has been the result for the groups of managers who have experienced job mobility.

The effect of removing response bias from attitude scales has not shown a consistent pattern. In terms of changing the magnitudes of correlation coefficients, the number of times the coefficients have been decreased outnumbered the times increased. If the sole objective of a study is prediction, then uncorrected attitude scales yield larger values for estimates of the strength of relationships. If explanation is the objective, then scale properties are as relevant as the absolute magnitude of predictor-criterion correlations. Consequently, more confidence may be placed in slightly smaller estimates of the strength of relationships.

**Attitudes and role activities**

Activities which are associated with the performance of the three managerial functions, directing, training, and staffing, constitute an important set of indicators for
evaluating the strength of relationships between attitudes and behavior. These functions incorporate almost all facets of personnel management. An important constituent of these activities is interpersonal communication, both written and verbal. Furthermore, these are activities in which managers can be active participants. It is expected that the attitudes of managers are likely to affect behaviors associated with these functions since communication is a major component of these functions. Attitudes, which may act as potential prescriptions for interaction, are evaluated with respect to their effect on actual patterns of interpersonal interaction.

Table 15 contains correlations of the measure of directing activities and the five attitude scales developed previously.

Managers who hold traditional attitudes, who are located in small firms and who have not experienced job mobility, tend to perceive negative utility in the activities associated with the directing function. The opposite form of relationship is shown for mobile managers in small firms. Although the measure of association is positive, its magnitude may be a consequence of a lack of organizational resources to implement a specific set of personnel-oriented activities. Mobile managers in small and large firms show moderate correlations with attitudes and directing activities. It appears that experience gained in more than one organization environment has not only made the managers more aware of personnel direction, but has also
Table 15. Zero-order correlations, all attitude scales with variable directing for total sample and all levels of moderator variable

<table>
<thead>
<tr>
<th>Attitude scale</th>
<th>Total (n=153)</th>
<th>Group 1 (n=46)</th>
<th>Group 2 (n=49)</th>
<th>Group 3 (n=32)</th>
<th>Group 4 (n=26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncorrected scales</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>.1768*</td>
<td>-.1683</td>
<td>.3681**</td>
<td>.1264</td>
<td>.3075</td>
</tr>
<tr>
<td>Control</td>
<td>.1999**</td>
<td>.1705</td>
<td>.3530**</td>
<td>.1585</td>
<td>-.0547</td>
</tr>
<tr>
<td>Individualism</td>
<td>-.1807*</td>
<td>-.1659</td>
<td>-.1147</td>
<td>-.2681</td>
<td>-.2457</td>
</tr>
<tr>
<td>Activity</td>
<td>.1589*</td>
<td>-.0015</td>
<td>.2826*</td>
<td>-.0082</td>
<td>.3917*</td>
</tr>
<tr>
<td>Directing</td>
<td>.5534**</td>
<td>.5583**</td>
<td>.5523**</td>
<td>.4809**</td>
<td>.6562**</td>
</tr>
<tr>
<td>Corrected scales</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>.2174**</td>
<td>-.1474</td>
<td>.3777**</td>
<td>.1876</td>
<td>.3997*</td>
</tr>
<tr>
<td>Control</td>
<td>.2681**</td>
<td>.2518*</td>
<td>.4395**</td>
<td>.2000</td>
<td>.0143</td>
</tr>
<tr>
<td>Individualism</td>
<td>-.1699*</td>
<td>-.1561</td>
<td>-.1025</td>
<td>-.2638</td>
<td>-.2252</td>
</tr>
<tr>
<td>Activity</td>
<td>.2578**</td>
<td>.0559</td>
<td>.4173**</td>
<td>.1686</td>
<td>.4688**</td>
</tr>
<tr>
<td>Directing</td>
<td>.5851**</td>
<td>.5672**</td>
<td>.6092**</td>
<td>.5179**</td>
<td>.6607**</td>
</tr>
</tbody>
</table>

* Significant at the .05 level.
** Significant at the .01 level.
stimulated activities associated with this function.

The measure of directing activity shows only one moderately strong positive relationship with the Control scale. Group two managers may supply a great deal of supervision to personnel associated with the marketing function. It is very likely that these managers have sound knowledge of markets and competitors' resources. The relationship shown for all groups combined is statistically significant, but does not appear to have much substantive significance in view of the range of correlations among the four groups.

Managers holding strongly individualistic attitudes are unlikely to devote much time to directing activities. The degree of association is small, but consistent, among the four groups of managers. This appears to be a relationship which may be generalized to the total sample since the degree of association for all groups combined is on the same order as the average of the four individual groups.

Attitudes reflecting the desirability of physical rather than mental activities show a moderately strong degree of association with directing activities. Managers who tend to become closely involved with direct supervision of firm operations are more likely to be in larger rather than smaller firms. There does not appear to be a differential effect due to high job mobility among managers of the large firms in
group four and the lack of such mobility of managers in group two.

The attitude scale Directing consistently shows the strongest degree of association to directing activities. The magnitude of correlations is consistent for firms of differing size and for managers with different degrees of job mobility. Overall, the estimate on the total sample appears to be representative of within-group correlations. For this particular function, it appears that activities will be initiated which reflect the perceived importance of stated needs.

Scales corrected for response set showed fairly substantial improvement in the degree of association. This was most evident for correlation coefficients in the range of .25 to .35 before correction. For Coefficients of Determination, differences in magnitude of up to .10 were achieved. The instances in which corrected scales showed lower correlations than their uncorrected counterparts were few and statistically nonsignificant.

The management function, training, involves the dual-purpose process of socialization of new employees by acquainting them with organizational policies and procedures and by imparting sufficient knowledge for effective task-performance. Training activities may be allocated to two classes; on-the-job training and supplemental training such as night classes, correspondence courses, or in-house seminars. The function
training, as it is used in this study, implies management involvement with task-oriented leadership rather than socio-emotional leadership. In terms of organization functions, training is one means by which adaptation is accomplished.

As shown in Table 16, training activity, for the total sample, is moderately related to the Traditional and Activity scales, the largest correlation being on the order of .20. Leadership, in the form of positive attitudes toward employee direction, is seen as being important for effective communication of knowledge. Managers in group one deviate from the pattern set for the total sample by showing inverse relationships with training and the Traditionalism and Activity scales. In contrast to the relationships shown for groups two and three, this implies that the meaning of the training function tends to be somewhat different for small and large firms, as well as for managers who have experienced some job mobility. Managers in group four show a completely different pattern than the other three groups. For managers in this group, training activities are related only to positive attitudes toward physical activity.

Two factors which could affect the observed relationships are a minimal degree of manager-employee role differentiation among small-firm managers who have not experienced job mobility and the delegation of responsibility for training in large firms by managers who have experienced job mobility. In
Table 16. Zero-order correlations, all attitude scales with variable training for total sample and all levels of moderator variable

<table>
<thead>
<tr>
<th>Attitude scale</th>
<th>Total (n=153)</th>
<th>Group 1 (n=46)</th>
<th>Group 2 (n=49)</th>
<th>Group 3 (n=32)</th>
<th>Group 4 (n=26)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correlations of training and all scales</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncorrected scales</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>.1573*</td>
<td>-.1812</td>
<td>.3872**</td>
<td>.3680*</td>
<td>-.0269</td>
</tr>
<tr>
<td>Control</td>
<td>.0307</td>
<td>.1328</td>
<td>.1433</td>
<td>-.0697</td>
<td>-.0294</td>
</tr>
<tr>
<td>Individualism</td>
<td>-.1026</td>
<td>-.1271</td>
<td>-.0708</td>
<td>-.2632</td>
<td>.1482</td>
</tr>
<tr>
<td>Activity</td>
<td>.1722</td>
<td>-.1782</td>
<td>.3493**</td>
<td>.3550*</td>
<td>.2894</td>
</tr>
<tr>
<td>Directing</td>
<td>.2043**</td>
<td>.2126</td>
<td>.2905*</td>
<td>.3819*</td>
<td>-.0892</td>
</tr>
</tbody>
</table>

| Corrected scales | | | | | |
| Traditionalism | .1694* | -.2048 | .3867** | .3860* | .0366 |
| Control | .0785 | .1865 | .2423* | -.0291 | -.0465 |
| Individualism | -.1003 | -.1246 | -.0586 | -.2755 | .1486 |
| Activity | .1625* | -.1425 | .3331* | .3416* | .2594 |
| Directing | .2055** | .2375 | .3250* | .3205* | -.0955 |

* Significant at the .05 level.
** Significant at the .01 level.
the former group, training activities may be associated with activities related to the directing function. In the latter management group the training function may be one in which the manager has peripheral involvement and whose concern is with quantitative rather than qualitative assessments. Consequently, attitudes toward the importance of this activity would not necessarily be supported by a corresponding active involvement with activities related to this function.

The correction for response set appears to have yielded fewer increases of smaller magnitude in the correlation coefficients among the attitude scales and the training-related activities, as compared to relationships between corrected and uncorrected attitude scales and directing activities. One possible explanation for the generally smaller coefficients is that behavior which is primarily expressive rather than instrumental is most susceptible to conditioning by attitudes. Better estimates of individual attitudes derived from modified measurement scales will result in higher correlations when the behavior is voluntaristic and expressive.

Staffing is a recruitment function involving personnel interviews and the establishment of criteria for evaluating applicants. Based on the total sample of managers, as shown in Table 17, attitudes which have the strongest degree of association with the Staffing scale are those which emphasize performance ability rather than thought problems. This is not
Table 17. Zero-order correlations, all attitude scales with variable staffing for total sample and all levels of moderator variable

<table>
<thead>
<tr>
<th>Attitude scale</th>
<th>Total (n=153)</th>
<th>Group 1 (n=46)</th>
<th>Group 2 (n=49)</th>
<th>Group 3 (n=32)</th>
<th>Group 4 (n=26)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uncorrected scales</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>.1769*</td>
<td>.3016*</td>
<td>.2375*</td>
<td>-.1130</td>
<td>.0886</td>
</tr>
<tr>
<td>Control</td>
<td>.1245</td>
<td>.0649</td>
<td>.4817**</td>
<td>-.0636</td>
<td>-.1649</td>
</tr>
<tr>
<td>Individualism</td>
<td>-.0026</td>
<td>.0137</td>
<td>.0710</td>
<td>-.0438</td>
<td>-.1182</td>
</tr>
<tr>
<td>Activity</td>
<td>.2526**</td>
<td>.4166**</td>
<td>.3638**</td>
<td>-.1420</td>
<td>-.0132</td>
</tr>
<tr>
<td>Directing</td>
<td>.1645**</td>
<td>.0406</td>
<td>.3425**</td>
<td>.0790</td>
<td>.1651</td>
</tr>
<tr>
<td><strong>Corrected scales</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditionalism</td>
<td>.1580*</td>
<td>.2321</td>
<td>.2422*</td>
<td>-.0875</td>
<td>.1068</td>
</tr>
<tr>
<td>Control</td>
<td>.0912</td>
<td>.0089</td>
<td>.4126**</td>
<td>-.0399</td>
<td>-.1499</td>
</tr>
<tr>
<td>Individualism</td>
<td>-.0102</td>
<td>.0040</td>
<td>.0685</td>
<td>-.0585</td>
<td>-.1257</td>
</tr>
<tr>
<td>Activity</td>
<td>.2400**</td>
<td>.3995**</td>
<td>.3594**</td>
<td>-.1566</td>
<td>-.0451</td>
</tr>
<tr>
<td>Directing</td>
<td>.1335*</td>
<td>.0055</td>
<td>.2431</td>
<td>.1287</td>
<td>.0968</td>
</tr>
</tbody>
</table>

* Significant at the .05 level.

** Significant at the .01 level.
unexpected since a candidate's employment record is primarily one of achievement and mastery of skills commonly used in agricultural occupations. Attitudes toward employee direction and leadership may enter as a basis for appraising the potential of a prospective employee. Reliance upon traditional attitudes as guiding principles in selecting employees indicates that there is little chance that the nature of the staffing activities will undergo drastic change.

Managers in group one show an even stronger dependence upon traditional orientations in the staffing function. They also place a high value on demonstrated physical ability in a prospective employee's past record of performance. Because firms in this group have ten or fewer employees, it is expected that task specialization is of fairly low degree. This may necessitate the requirement that employees be able to function effectively in a wide range of tasks, most of which are physical in nature.

Managers in group two tend to associate attitudes toward environmental control with activities relating to the staffing function, as evidenced by the correlation of .48. Managers in this group, being employed by firms which have more than ten employees, may be in a better position to seek out and service customers because they have greater amounts and varieties of resources at their disposal. Consequently, their hiring practices will be oriented toward skilled field representatives
as well as local operatives. This facet of staffing also implies that a manager supply a higher level of direction and motivation for effective employee performance.

Attitude-behavior correlations for managers in groups three and four show that all attitude scales are essentially unrelated to activities associated with the staffing function. A characteristic shared by managers in both of these groups is that they have acquired management experience in two or more firms.

All corrected scales, with one exception, tend to show lower correlations with staffing activity than the uncorrected scales. It is possible that staffing, like training, involves activities which are more highly structured and less dependent upon personal initiative for their execution. That is, not only are the staffing and training functions more instrumentally oriented than directing, but the procedural guidelines for these functions may be more highly codified. Consequently, there would be less opportunity for a manager to incorporate his own style of expressive behavior into the activities. These conditions may be reflected in the relatively low correlations between attitudes and nonvoluntary behaviors.

Summary of attitude-behavior relationships

The analysis of relationships between attitude scales and measures of managerial performance has demonstrated the utility of a moderator variable for specifying conditions under which
differential estimates of relationships may be obtained. It is evident, in comparing within-group estimates of attitude-behavior relationships, that correlations based on the total sample of managers are frequently insignificant because differences in the magnitude and sign of within-group coefficients force cancellation in the overall estimate. This is precisely the type of condition which justifies the use of moderator variables. Each "level" of the moderator variable may "specify" a different within-group structural relationship.

The effectiveness of the moderator variable is seen in the four attitude-behavior correlation matrices. Inferences which would be based on estimates using the total sample of managers are likely to be substantively inconclusive, although many coefficients are statistically significant. This type of result is seen in the relationship between Role Performance and the scales Activity and Individualism, between Training and the scales Activity and Individualism, and between Staffing and the Activity scale. Conversely, the within-group analyses have shown that attitudes do have a differential impact on managerial performance, depending upon a manager's prior experience and the size of the organization in which he is a member.

The wide variation in magnitude and sign of coefficients among groups suggests that agricultural cooperative managers do not constitute a homogeneous population to which
unconditional attitude-behavior relationships may be inferred. The data imply that there are at least three populations about which different inferences may be made.

Indicators of role activity have been selected to represent types of managerial functions in which a manager's performance was expected to be most susceptible to the effect of attitudes. These functions, relative to others in the organization, are most likely to be subject to a wide variety of interpretations and implementations.

Among the three management functions, directing activities have shown the strongest degree of association with attitudes whose object is employee direction and a lesser degree of association with the scales Traditionalism and Control Estimates of the strength of relationships between the five attitude scales and activities related to the training and staffing functions were less pronounced. Major exceptions to generally low correlations between attitudes and the latter functions have appeared in groups two and three of the moderator variable.

Where activities associated with a management function have the potential for formalization and routinization, as may be the case with training and staffing, attitudes may not be salient as guides for managerial behavior. The pattern of correlations in the attitude-behavior matrices also suggests, by visual inspection, that expressive, volitional activities
are more strongly related to attitudes than activities which are primarily instrumental. This pattern corroborates the position taken in Chapter one, that when few attitudes are implicated by an object, prediction of activities associated with that object becomes more precise.

The effect of the correction for response set was unpredictable. The largest correlations between attitudes and the variable Role Performance were reduced after the data was corrected. The opposite effect was observed in correlations between attitude scales and the variable Directing. The variables Training and Staffing showed inconsistent changes in their correlations with attitude scales after the attitude items had been adjusted to account for response set.

In general, it appears that strong correlations, on the order of .50, are increased only slightly by the correction procedure. However, gains in the value of $r^2$ may be considerable. Moderate correlations, those in the range of .25 to .35, tend to undergo the largest changes, but the directions in which change occurs are not uniform among variables or groups. The effect of response set correction on correlations which are small initially is relatively minor. Incremental changes in the magnitudes of correlation coefficients were most apparent within groups two and four, representing managers in larger firms.
CHAPTER 7. SUMMARY AND IMPLICATIONS

Introduction

The long involvement of sociologists with attitude research has generated a mass of empirical evidence, much of which is contradictory. Observed consistencies between what people say and what people do have not materialized except on rare occasions. These results have called into question many theoretical assumptions about the efficacy of attitudes as stimuli and guiding principles for social behavior.

Similar inconsistencies have been observed in the study of personality structure, the major objectives of which have been to cross-classify personality traits and global patterns of behavior. Consistent patterns or relationships between personality variables and behavior patterns have rarely materialized.

Psychologists have been involved in the study of response biases for about three decades in an attempt to resolve some of the observed inconsistencies. Two major orientations have evolved from these investigations. One has lead to the conceptualization of such biases as inherent components of personality, a group of relatively enduring traits that predispose predictable response patterns regardless of the construct being investigated or the instrument which is used to measure it. The second orientation has not subscribed to the
trait approach, preferring to treat estimates of such bias as nonrepeatable, idiosyncratic response error.

The juncture of these two fields of research has yielded theoretically interesting and useful results. A major outcome has been that measures of personality traits must entertain the possibility that at least a part of the response is dependent upon the characteristics of the instrument employed at a given time. Extensions to this orientation have recently been made by sociologists investigating the effect of social structure upon patterns of responses to personality inventories. The latter studies have called into question, not only measurements of the constructs themselves, but estimates and inferences which have been made with respect to the measured variables.

The implications or response biases may be extended to the scales used to measure attitudes and to relationships that may exist between attitudes and certain classes of behaviors. A common denominator of many scales used to represent a variety of attitude constructs is the measurement technique itself. One of the most widely used and accepted techniques is the method of Summated Ratings, more commonly known as Likert-type scales. The method of Summated Ratings makes certain assumptions which may possibly be violated if response bias is incorporated into values which are assigned to scale items. These biases may lead to inaccurate estimates of the strength of attitudes in a population and to incorrect
inferences about the strength of relationships between attitudes and behavior. The method of Summated Ratings is an important focus of investigation because of its use as measurement tool in survey research, the means by which much of the data used by sociologists has been collected.

The bases for inquiry in this dissertation are primarily exploratory. Interest has been focused on extending and adapting existing concepts and techniques for assessing response bias to measurement techniques used in sociological investigations. Specific objectives of this dissertation are:

1. To assess the effectiveness of existing techniques for estimating the magnitude of response biases in measurement instruments and for controlling for the effect of such biases in attitude scale development.

2. To develop and evaluate a nonexperimental technique for estimating and controlling for the effect of instrument bias in sociological investigations.

3. To assess the correction technique with regard to its effect upon indices representing scale properties.

4. To evaluate the effect of controlling for instrument bias in estimating the strength of relationships among attitudes and behavior.

5. To determine the effect of moderator variables used to represent situational constraints on estimates of the relationship between attitudes and behavior.
Research Methodology

Employing conceptual orientations developed by Himes (1967), five attitude constructs were defined in terms of their theoretical relevance for organizational decision-makers. A battery of attitude items developed in a previous study by Warren et al. (1973) was used as a basis for selecting fifty-one attitude statements that appeared to reflect homogeneous conceptual orientations. A correlation matrix, based on these fifty-one items, was then formed. The inter-item correlation matrix was factor analyzed to determine the empirical dimensions of the matrix and the overall goodness of fit of the selected items to the empirically derived dimensions. Judgments based on statistical and theoretical considerations were made in selecting items which appeared to best represent the attitudinal constructs. A total of twenty-one items were retained as being most representative of the five attitude constructs.

Estimates of inter-item variability for each subject in the sample were obtained by calculating the standard deviation among items for each of the five attitude clusters. This resulted in five estimates of within-scale variability for each subject. Each of the five estimates was based on the set of items which were associated with a specific construct. For instances in which a subject gave the same scale value to all 'k' items in a set, the value \( \left( \frac{1}{k} \right)^{\frac{1}{2}} \) was assigned as the
estimate of within-cluster variability. The within-cluster standard deviations were used to represent the degree of individual discriminant perception among items in a scale.

Twenty-one multiple regression models were used to obtain estimates of subjects' scale-item values which were corrected for response set. The dependent variables in the models were the original scale values. Independent variables were estimates of response set. Items which belonged to a given scale were regressed on only the estimate of response set for that scale. Differences between the original item values and estimated item values were treated as item values which were corrected for the effect of response set. By virtue of the partialling technique employed, the corrected item values are independent of the estimates of response set.

A comparative evaluation of each of the five uncorrected and corrected scale clusters was made to determine the effect of the response set estimates and correction technique on scale properties. Five properties of scales were incorporated in the evaluation. They are: (1) additivity; (2) homogeneity of variance; (3) symmetry of covariance matrices; (4) scale reliability; and (5) scale orthogonality. Univariate and multivariate statistical tests were employed for purposes of comparison in evaluating additivity, homogeneity of variances, and symmetry of covariance matrices. The remaining properties were evaluated by inspection.
The moderator variable was defined by four groups representing the joint distribution of two dichotomous variables. The resultant grouping consisted of managers who had or had not experienced job mobility and who were employed in large or small firms. Job mobility was classified as low if a manager had not held a previous management position in another organization and high if he had. Firms were classified as small if they employed fewer than eleven employees and large if they employed eleven or more employees.

Product-moment correlations were the measures of association used in estimating the strength of relationships among attitudes and behavior. The use of correlations is supported by tests, on all variables used in the analysis, for within-group homogeneity of variances.

Empirical Results

Evaluation of scale properties

The evaluation of scale properties indicated that the correction for response set virtually eliminated nonadditivity among scale items. Nonadditivity was significant at the .05 level in three of the five uncorrected sets of scale items. After correction, only one scale exhibited significant nonadditivity, and even that ratio had been reduced by a factor of five.
Among the uncorrected scales, three of the five exhibited statistically significant nonhomogeneity of item variances. After correction two of the scales showed significant departure from the assumption of homogeneity. In general, the size of the variance ratios used in the test were made smaller after the scale items had been corrected.

The effect of the response set correction on the symmetry of the five scale covariance matrices was inconclusive. The assumption of symmetry was met by the Directing scale after correction, but not before. The Individualism scale was changed from symmetric to asymmetric by the correction technique. In both cases, three of the five scales exhibited statistically significant asymmetry.

In all scales, estimates of scale reliability were increased after the scale items had been corrected. The greatest increases occurred in scales which had reliability coefficients on the order of .50. Scales such as Traditionalism, with reliabilities larger than .70 saw little increase after scale items had been corrected.

The matrix of inter-scale correlations showed little change after the scale items had been corrected. Among the five scales, Traditionalism, Control, and Individualism showed intercorrelations close to zero. The scale Activity was positively correlated with Traditionalism. Directing showed
a moderate negative correlation with the scale Individualism and moderate positive correlations with all others.

**Evaluation of attitude-behavior relationships**

The analysis of within-group relationships among attitudes and behaviors was supported by evidence that the attitude scales were not significantly related to the moderator variable. Examination of correlation coefficients for the attitude scales and the variable Role Performance showed fairly homogeneous, moderate, positive correlations for the total sample. Considerable variation was seen among groups. In group two the variable Role Performance had a correlation of .5 with the Activity scale and correlations of .37 and .38 with the scales Control and Directing. In group three it had a correlation of .48 with the Individualism scale. There did not appear to be significant improvements in the magnitude of correlations as a result of the response set correction.

Correlations among variables representing the three management functions and the five attitude scales showed a distinct trend of changes in magnitudes as the activity represented by the variables shifted from highly expressive behavior to more instrumentally oriented behavior. Correlations of many attitudes with Directing were large, while those with Staffing and Training tended to be small in magnitude. Some coefficients were as large as .66 for the relationship between the scale Directing and the measure of directing activity in group
four. Correlations of these variables in other groups were in the range of .48 to .56 (uncorrected) and .52 to .61 (corrected). Coefficients were not homogeneous for results based on the total sample, nor for any of the group by scale combinations.

Training activity showed the strongest relationship with the variable Traditionalism among managers in group two and with Activity and Directing in groups two and three. Correlations showed great variability among groups. Differences in signs forced correlations for the total sample to be small as a result of cancellation. The correction for response set tended to attenuate the strongest relationships and gave slight increase to moderate-sized coefficients.

Staffing activity showed correlations in the range of .35 to .42 with the scale Activity for groups one and two and a correlation of .48 with the scale Control for group two. Other coefficients were small and showed considerable variability in sign among the four groups. Managers in groups three and four evidenced a complete lack of association between attitudes and their activities associated with the Staffing function. The effect of the response set correction did not show consistency. In some cases moderate correlations were increased in magnitude, but the magnitude of the largest correlations was usually decreased when corrected scales were used in the analysis.
In general, the effectiveness of the response set correction remains inconclusive. This must be the case since there is no a priori knowledge of the "true" value of measures of association. Consequently, decreases in the magnitude of coefficients should be as meaningful as increases. However, in estimating relationships which had been expected to be strong and positive, as is the case of the Direction scale and directing activity, the corrected scales, in each group, gave larger estimates than the uncorrected scales. The validity of the estimates lie in the method by which they are obtained. The "truth" of the estimates depends upon confirmation through replication.

Implications

Consideration of the findings must be tempered by the fact that the data are of high quality. Measurement scales employed in the assessment of attitudes are based on the Certainty technique, a method of presenting a response format which has been shown to yield desirable scale properties. Furthermore, much effort has been expended to ensure that the attitude scales used in this dissertation are optimum in terms of conceptual homogeneity, concreteness, and independence before the response set corrections had been applied.

The rationale behind this approach has been to provide a "worst case" set of conditions under which the method must
prove itself. That is, a set of strong conditions most likely to inhibit positive results have been employed. Despite this negative bias, the method shows evidence of potential utility in reducing the effect of nonadditivity in scales which employ multiple indicators, and indirectly, by enhancing the magnitude of correlations among some measures of attitudes and behaviors.

The results of the analysis of scale properties have demonstrated that despite the fact that close attention was given to statistical and conceptual refinement of scales, in very few instances were all assumptions of the scaling model met. This would seem to point out some basic weaknesses in the Summated Ratings method, its utility and widespread application not withstanding.

More attention must be given to the fact that reliability coefficients are only a reflection of gross scale properties. Many assumptions of a scaling model may be violated while reliability remains reasonably high. The "proof" of a scale is not only in its reliability coefficient, but in other properties such as homogeneity of variances and covariances and the additivity of scale items. When these assumptions are known to hold, then one may place confidence in inferences derived from measures of association between a scale and other constructs of theoretical interest. If these assumptions do not hold, then empirical support or lack of support for an hypothesis must go begging for interpretation since the
evidence may be negated in more than one way.

**Further applications for response set estimates**

This methodology is not necessarily restricted to the scaling and measurement of attitudes or to the use of the Summated Ratings method. The method developed in this dissertation may be employed under any conditions where individuals are required to perform a task which involves rating or ranking an object with respect to a specified attribute. The Thurstone scaling technique, preference rating, and other scaling methods which involve an individual's discriminai perception may incorporate into the scale undetermined amounts of variability due to response set. This type of bias may be accounted for by this methodology.

Another characteristic of the method is that it may be used, on an ad hoc basis, to adjust any rating or judgmental scores which have been collected by survey research techniques. This feature incorporates flexibility into the analysis stage of a research project without the necessity of becoming involved with design considerations which may only be incidental to the major objectives of the project. If response biases are not deemed important, no information is lost. If response biases appear to be an important issue after an initial exploration of the data, then the estimates and correction may be employed without necessitating the collection of additional information. The model which defines response set may be treated as an
hypothesis subject to the usual rules of statistical inference.

An alternate application for the estimates of response bias is in the investigation of response set as a theoretical construct. Rather than using this variable as a means for estimating scale variance which is free of this type of confounding influence, it may be used directly as a categorical treatment variable in an ANOV model or as a quasi-continuous predictor in a stochastic regression model. In either case the construct represented would be the degree of discriminable dispersion. Variables which might be investigated under different levels of discriminable dispersion could be measures of racial prejudice, class consciousness, or political extremism.

Generalizability of attitude-behavior relationships

The analysis of attitude-behavior relationships indicates that closer attention must be given to the specific conditions and contexts under which attitudes are expected to serve as guidelines for action. As Hay (1973:247) has noted, the specification that certain constraints be a prior condition for the existence of theoretically meaningful relationships seriously restricts the search for "universal" relationships in many fields of study.

This has been demonstrated where different within-group estimates of parameters have been similar in magnitude, but of opposite sign. These constraints point out the limits of generalizability of the estimates of within-group relationships.
The use of constraints, however, enables the specification of hypotheses which are more sensitive to complexities of the "real world" phenomena under investigation. Constraints create middle-range theories which may be susceptible to potentially stronger tests than general theories.

Likewise, the type of behavior which is expected to be guided by attitudes requires careful consideration. Within a specified context, behaviors which are instrumental and routinized appear to be less susceptible to attitude stimuli than actions which may be classified as voluntaristic and expressive. Hence, it is not surprising that a large volume of negative evidence pointing to the inadequacy of attitudes as predictors of behavior has been accumulated.

Future research into relationships among attitudes and behaviors must be cognizant of the types of attitudes which are defined and the types of behavior to which they may be related. It must be remembered that attitude may be expected to serve as a stimulus and guide for action only in situations where other criteria have failed or where they are relatively undefined. That is, the effect of attitudes on action may be incorporated only by excluding competing evaluative criteria. Furthermore, an attitude construct whose object is very general, vague, or ambiguous is unlikely to reflect a useful prescription for action even in situations in which other guidelines are inappropriate.
REFERENCES

Althauser, Robert P. and Thomas A. Heberlein

Argyris, Chris

Bem, Daryl J.

Berlew, David E. and Douglas T. Hall

Blankenship, L. Vaughn and Raymond E. Miles
1968 "Organizational Structure and Managerial Decision Behavior." Administrative Science Quarterly 13 (June): 106-120.

Blau, Peter M.

Bohrnstedt, George W.

Brayfield, A. H. and W. H. Crockett

Campbell, D. T. and D. W. Fiske
1959 "Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix." Psychological Bulletin 56 (March): 82-105.

Carr, Leslie G.


Edwards, Allen L.

Edwards, Allen L.

Edwards, Allen L. and J. A. Walsh

Ehrlich, Howard J.

Ehrlich, Howard J. and James W. Rinehart

Etzioni, Amitai

Farmer, R. N. and B. M. Richman

Fredrickson, N. and Samuel J. Messick

Fuguitt, Glenn V. and Stanley Lieberson

Fullan, Michael
Georgopoulos, Basil S.

Ghiselli, Edwin E.

Glock, Charles Y.

Hage, Jerald and Michael Aiken

Hay, David A.

Heise, David R.

Heise, David R. and George W. Bohrnstedt

Himes, D. H.

Indik, Bernard P.

Indik, Bernard P.
Jackman, Mary R.  

Jackson, D. N.  

Jackson, D. N.  

Jackson, D. N. and L. Pacine  

Lawler, E. E.  

Lawler, E. E. and L. W. Porter  

Lazarsfeld, Paul F.  

Lichtman, C. M. and R. G. Hunt  

Liu, An-Yen  
Liu, An-Yen and Leroy Wolins

Loevinger, Jane

Martin, N. H.

McGee, Richard K.

Messick, Samuel J.

Messick, Samuel J.
1962  "Response Style and Content Measures from Personality Inventories." Educational and Psychological Measurement 22 (Spring):41-56.

Messick, Samuel J.

Micklin, Michael and Marshall Durbin

Mueller, D. J.

Nunnally, Jum C.


Snedecor, George W. and William G. Cochran

Specht, David A. and Richard D. Warren
1974  "Comparing Causal Models." (Accepted for publication in Sociological Methodology 1976.)

Summers, G. F.

Talacchi, Sergio

Tausky, Curt

Thompson, James D.

Triandis, Harry C.

Vidulich, R. N. and F. W. Krevanick

Warland, Rex and John Sample

Warner, Lyle G. and Melvin L. DeFleur
Warren, R. D., G. E. Klonglan, and M. M. Sabri  

Warren, R. D., C. L. Mulford, and M. J. Yetley  

Westie, F. L.  

Winer, B. J.  

Wolins, L. and A. C. Mackinney  
1965 A Theory-Based Scale for Measurement of Responses to the Methathetic Class of Stimuli. Unpublished, mimeographed proposal submitted to the National Science Foundation, Washington, D.C. Department of Psychology, Iowa State University, Ames, Iowa.
APPENDIX A: ATTITUDES

The following list presents statements in the form in which they were shown to respondents in the sample. The twenty-one statements are grouped according to the attitude scale they represent. All statements used the "Certainty" response framework shown below. Numbers preceding each statement refer to the statement number which appears on the original interview schedule and to the Alphanumeric names (ATTnnn) which identify the responses on related computer data files.

Response format: A 1 2 3 4 5

A. Traditionalism

20. I think the traditional ways are the best ways of doing things.

38. A manager is better off to continue traditional management practices since many of the new-fangled ideas are not suited to his business operation.

55. In the long run, a manager is better off to establish a pattern and stick with it rather than to continually change his business operation.

62. It is more important for the dealer to make decisions on the basis of past personal experience than to try to find out new ways to do things.

64. It is more important for managers to make decisions on the basis of past experience and rules of thumb than to try to find new ways of doing things.

67. Before trying any new practice or idea, it is pretty wise to wait and see how it is working out for some of the other businesses.
B. Control
30. The slack seasons in farm product handling can be overcome readily by good planning by the manager.
39. A good co-op manager does not have great difficulty overcoming stiff local competition.
50. A good manager can overcome most marketing problems that he faces.
53. Losses due to market change can be effectively hedged against.

C. Individualism
23. An individual should try to solve his own problems by himself.
26. For the most part an individual should "go it alone" and make his own decisions.
52. Perhaps the greatest reward in a management position is the opportunity to make your own decisions.

D. Activity
6. A manager's most important asset is a "strong back."
17. Many managers spend too much time trying to think through alternate ways of doing a job rather than going ahead and doing the job the way they already know.
29. A manager's willingness to spend some time assisting with day to day operations, such as with the grinding operation, is more important in a successful business than all the new ideas he reads or hears about.
63. Thinking, reading, and planning are not really important to me in managing this business.
66. The best way to solve problems is to dig in and work on them immediately instead of wasting time trying to think of better or easier solutions.
E. Directing

31. Most workers don't really care whether a job is interesting and challenging.

33. Under the right conditions workers will seek and accept responsibility.

47. You can really get farther by talking with and cooperating with people.
APPENDIX B: MANAGERIAL PERFORMANCE

The following list represents questions addressed to each manager in the sample. Questions are grouped under the name of the variable with which they are associated. Some of the questions involve check-lists. A count of the number of items checked represents the value of a response. Other questions require qualitative and quantitative evaluation by trained judges in arriving at a numeric value for a response. Numbers which precede each question are those that are used in the 1971 schedule.

A. Role Performance

6 Have you ever used the field representatives of wholesale companies to assist you in this business? Include such things as: financial assistance, technical information, rental equipment, resale help, pamphlets and bulletins, financing on credit for customers, pricing policy, etc.

In what way(s) were they of assistance to you?

How valuable do you feel this assistance has been?

9 Do you seek any specialized outside help in the operation of this business to help you and the board make decisions and carry them out?

What type of specialized help do you use?

11 In making a major decision what steps or processes do you go through?

12 In making a major decision, which of the statements on CARD 4 best describes the methods you use in evaluating alternatives?

a. rely solely on managerial judgment in making most decisions.
b. work out potential profits (expected sales and expenses) but do not have detailed records which can be used as a base.
c. work out potential profits (expected sales and expenses) from records mentally.
d. work out potential profits (expected sales and expenses) from records on paper.

13 Once a major decision to make a change has been made, what are some of the things you would do to insure that the implementation of this decision will be successful? Include planning for change, and planning for the period after the change has been made.

15 Have you given any consideration to probable future sales trends in your trade area?

Which of the statements on CARD 5 best describes the methods you used?

a. made projections on the basis of personal judgment based on day-to-day knowledge of business potential.
b. worked out potential sales on paper or mentally by using some of the available sales records in my business.
c. worked out mentally the potential sales using business records and other available data.
d. worked out on paper the potential sales using business records and other available data.

16 What factors do you take into consideration in making decisions concerning how your business is organized into departments and functions. (Include decisions such as those concerning functions to be performed and departments to have.)

23 What do you take into consideration in selecting your wholesale sources and outlets?

24 How do you protect yourself against market price changes on products and supplies in inventory?

B. Training

46 What methods are used to train and develop your employees? Explain each of these.

129a Total number of management meetings attended.
129a Total number of coop managers.

129a Where do you regularly obtain information to help in the management of this cooperative?

129b Where do your directors obtain information they use in discharging their duties?

129c Where do your employees obtain information in the nature and philosophy of cooperatives?

C. Directing

B33 Under the right conditions workers will seek and accept responsibility.

B47 You can really get farther by talking with and cooperating with people.

B65 If a man wants a thing done right, he must do it himself.

29 As you think of merchandising your products, do you classify your farmer customers into different groups and use different selling approaches on them?

28 Which one of these statements best describes the way you feel about key employee relationships with patron-members?

a. They have a responsibility to keep themselves well informed and make recommendations on all our major product lines.

b. They have a responsibility to pass on only that information about our major product lines which is requested by the customer.

c. They should be extremely cautious in making recommendations about our major product line since a poor recommendation could result in a loss of customers.

d. They should provide the products requested by customers, but should make no recommendations about their uses.

30 What are the major factors you take into consideration in classifying (farmer customers)?

32 Employee production can be increased by periodically informing employees of their progress on their jobs.

33 Employee production can be increased by consulting employees on decisions that affect them.
Employee production can be increased by being interested in the personal well-being of your employees.

Employee production can be increased by informing workers when a change is coming up that will affect their jobs.

Employee production can be increased by telling employees why their work is important.

Employee production can be increased by telling employees that they're doing good work whether they are or not.

Most businesses attempt to create a favorable image with their customers. What are the essential features or ingredients in the image you are trying to create for this business?

Total number of product meetings, manager.

Where do you and your employees obtain information on products?

**D. Staffing**

Keeping in mind your high school experience, how would you rank yourself as a student?

How would you rank yourself as a manager?

Where would you belong in a list of 100 typical people in the kind of job you do best?

How do you feel about your self-confidence?

What methods do you use to determine the number and qualifications of the employees needed in your business firm?

When pricing products and services several factors must be taken into account. Under certain conditions it may be wise to maintain a wide margin even at the sacrifice of sales volume while in other instances it would be better to maintain a smaller margin to get increased sales volume.

For each situation, please state whether you would maintain a large margin with the possibility of decreasing the volume, or maintain a small margin with the possibility of increasing the volume.
(ENCIRCLE ONE)

L S 1. Brand handled is recognized by customers as superior to that of competitors.
L S 2. Extra services wanted by customers cannot be (or are not) provided by this coop.
L S 3. Many other dealers in the trade area have full competitive lines.
L S 4. An aggressive sales and merchandising program is maintained.
L S 5. Many expenses are fixed so that total per unit handling costs decrease sharply as volume increases.
L S 6. Increased sales of this line have little value for increasing sales of other lines handled.

109 Will you please give me an interpretation of the status of this business as represented on these financial sheets?

110 What additional information do you need to take full advantage of these statements?

111 What do you feel are the main purposes of financial statements?

112 Persons conducting management training sessions often list certain functions of management. What do you consider to be the major functions of management?

136b How difficult do you feel it is to achieve the objective of efficiency, the ability to obtain the greatest possible return from the resources at hand?

140 How many years of formal education have you completed?
I.Q. Judgment raw score.
I.Q. Parts raw score.
Many persons must be recognized for their contribution to the author's graduate program and dissertation research at Iowa State University.

Dr. Richard D. Warren, major professor and academic advisor, is recognized for his valuable guidance and criticism throughout the research project. Valuable experience, both professional and vocational, was acquired by the author as a graduate research assistant under the direction of Dr. Warren. Acknowledgement must also be given to the many stimulating ideas he presented in the classroom and in innumerable informal discussions.

Dr. Gerald E. Klonglan and Dr. Leslie D. Wilcox are recognized for their assistance in the completion of this dissertation and for providing theoretical insights, in seminars and informal discussions, that were valuable in carrying out the dissertation research.

The author expresses his appreciation to Dr. Margaret Liston, Department of Family Environment, and Dr. Roy Hickman, Department of Statistics, for their encouragement and assistance as members of the author's program of study committee.

Appreciation is expressed to my wife Nancy for her encouragement in my pursuit of the doctoral degree and for her patience in making the sacrifices necessary for its completion.