THE METATHEORY OF FACETS: CONSTRUCT VALIDITY OF A STRUCTURAL APPROACH TO ATTITUDE MEASURMENT

Dissertation for the Degree of Ph. D.

MICHIGAN STATE UNIVERSITY
STEPHEN KENT BEDWELL

1977

This is to certify that the

thesis entitled

The Metatheory of Facets: Construct Validity of A Structural Approach to Attitude Measurement

presented by

Stephen K. Bedwell

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in **Counseling, Personnel Service & Educational Psychology**

Major professor

Date November 22, 1976

ABSTRACT

THE METATHEORY OF FACETS: CONSTRUCT VALIDITY OF A STRUCTURAL APPROACH TO ATTITUDE MEASUREMENT

By

Stephen Kent Bedwell

The present study examined the construct validity of facet theory applied to attitude measurement. Earlier research has used one of two approaches in defining attitude: either emphasizing attitude as a "predisposition" to behavior or regarding attitude as "behavior" per se. Recently the affective-cognitive-conative notion of attitude has been held by a majority of attitude theorists. Jordan (1968) has concluded that most research studies have been inconclusive or contradictory about attitudes because attitude scales utilized were composed of items stemming from different structures: i.e., from different levels of attitude (for example, the cognitive-affective-conative) of the universe of attitudes toward specified objects. Guttman (1950) has operationally defined attitude as "a delimited totality of behavior with respect to something." Jordan and Guttman have stated that it is productive to drop the dichotomy between attitude and behavior and have the term "attitude" embrace both varieties, the predisposition to respond and the response itself with "subvarities ranging from stereotypic generalizations to overt instrumental behaviors . . . ." Thus the term "attitude-behavior."

The purpose of the present research was to further examine relationships between the cognitive-affective-conative components of attitude across the attitude-behavior levels toward various attitude objects.

The metatheory of facets specifies certain structural outcomes of correlations dependent upon specific roles played by the facets (which have been incorporated in the design) and the structuples (a combination of elements of each facet) as the structuples become increasingly stronger. Various researchers have investigated and obtained the "simplex" (a structural outcome) relation predicted by facet theory and thus support for the construct validity of the theory has been obtained. No attitude studies have investigated the construct validity of facet theory where the joint (attitude levels) structioned and lateral (situations) structioned facets have been held constant across selected attitude objects.

In brief, the methodology of this study involved three attitude-behavior scales utilizing facet procedures toward physical, mental, and social attitude objects: (a) a mental retardation scale, (b) a race scale, and (c) a blind scale. These attitude objects were placed in the "same" social distance life situations (lateral structioned) at three joint structioned levels: stereotypic, moral evaluation, and personal feeling. The research was designed to control for sources of variation due to the joint and lateral dimensions, by holding constant these dimensions and changing only the subject-object in situation relationship. The scales were administered to a homogeneous sample to enable reduction of variance due to differential

contact with the attitude objects, social class, age, etc. The order of scale administration was balanced to control for progressive error and response set (Underwood, 1966).

Five research hypotheses were stated and, with exception of the order of scale administration effecting attitudes toward specific attitude objects, the results supported the hypothesis. A simplex relation was obtained for each of the social distance (lateral structioned) scales at each joint structioned level for each attitude object. The simplex structure was obtained for each facet-derived subscale at each level for each object. The cylindrex structural hypothesis was approximated: where joint structioned facets served an axial role, social distance situations served a modulating role, and attitude object served a polarizing role. And finally, smallest space analysis resulted in fewer dimensions than did factor analysis.

It was concluded that the construct validity of the metatheory of facets was further established, and that facet theory is a useful tool for specifying research designs, and in a priori structuring the relationships. It was recommended that further studies investigating an ordering principle for attitude objects, clarifying the lateral structioned (situations) facet to establish a more clear ordering principle and expanding upon and using a more heterogeneous population, are necessary. Without exploiting the data, it was further concluded that facet theory may be an extremely useful tool in designing classical experimental research designs, and perhaps eventually specifying counselor therapeutic relationships.

THE METATHEORY OF FACETS: CONSTRUCT VALIDITY OF A STRUCTURAL APPROACH TO ATTITUDE MEASUREMENT

By

Stephen Kent Bedwell

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Counseling, Personnel Services,
and Educational Psychology

1977

To my wife, Bernadette A. Bedwell, and her brother, Senator Anthony A. Derezinski: the two people who most influenced my educational pursuits. And to my parents, Clyde E. and Norma L. Bedwell.

ACKNOWLEDGMENTS

First, I would like to express my thanks to my advisor, chairman, and personal friend, Dr. John E. Jordan, for his unfailing confidence in my abilities, his guidance and encouragement in all aspects of this dissertation.

I also would like to express my appreciation to my committee members, Dr. Thomas Gunnings, Dr. James Engelkes, and Dr. Ronald Wolthuis, for serving as members of my doctoral committee. Also, my thanks to Dr. Ward Wilson for assisting in the collection of the data. Special thanks goes to Dr. James Lingoes for offering valuable assistance in the use of Smallest Space Analysis and the Guttman-Lingoes Nonmetric Series at the University of Michigan. Finally, to Professor Louis Guttman, I offer my sincere appreciation for explaining aspects of facet theory and nonmetric techniques, and his valuable critique of this study.

Furthermore, without the valued support of my friend Dr. James Stratoudakis who listened to my frustrations and offered his advice, this project would have been overwhelming. Muchas gracias to Guadalupe Solis for typing the final draft of this dissertation.

To my wife Bernadette goes the role of supporter, pusher, and confidante: she willingly typed many drafts of this thesis; she gave of her valued and limited relaxation time to listen to my

ideas and frustrations. Without her support this dissertation and Ph.D. would not have been possible. Also, bless my children who gave of their "Daddy time"; Natalie, Anthony, and Vincent, Daddy loves you.

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PREFACE

This study is an example of the project approach to graduate research: it is one in a series, jointly designed by several investigators, each study acting as a building block to further extend and explore the theoretical underpinnings of facet theory. Therefore, similarities in the approach to research problems, theoretical material, instrumentation, design, and analysis are both necessary and desirable. Nevertheless, some theoretical specifications, localities, samples, necessary adaptations, and interpretations in each study are those of the authors.

CHAPTER I

INTRODUCTION

Overview: Definitional Status of Attitude Constructs

It is axiomatic that attitudes are projected to have major import on decisions made in all areas of life, both for individuals and society. Daily, the media bombard the public with recent findings from various pollsters concerning the latest inclination of the public toward a particular attitude object: the economy, politicians, legislation, and Blacks--to name only a few. It is also projected that this activity may in fact generate attitudes in its own right. In addition, attitude is one of the most popular concepts in the social sciences, having been in use among psychologists for more than 100 years (Elizur, 1970). This has been especially true since Allport's classic article (Allport, 1935) which gave emphasis and definitional status to the concept of attitude. Some social scientists have even suggested that social psychology be defined as the scientific study of attitude (McGuire, 1969). However, there still exists no commonly accepted definition of the hypothetical construct of attitude.

Two primary approaches have been used in defining attitude: one emphasizing attitude as a "predisposition" to behavior and the second regarding attitude as "behavior" per se. Behavior has been

viewed as spanning the cognitive, affective, and conative domain of the human condition. More than 100 years ago, Herbert Spencer wrote about the attitude of the mind, referring primarily to the cognitive nature of attitude (Brodwin, 1973; Elizur, 1970). Most theorists use two cognitive elements in the definition of attitude: evaluation and beliefs. In many attitude studies (Elizur, 1970) respondents are frequently asked to rate objects. Osgood, Suchi and Tannenbaum (1957) developed the semantic differential technique as a method to measure the meaning of concepts and concluded that meaning is a location in a space defined by some number of factors or dimensions. An attitude toward a concept is its projection onto one of these dimensions defined as "evaluative." The semantic differential researchers posit that attitude is expressed in terms such as good-bad, kind-cruel, honest-dishonest.

Emotion regarding the attitude object is included in Thurston's definition: Attitude is the affect for or against a psychological concept. ". . . Appetition is the positive form of affect, which in more sophisticated situations appears as liking, defending, or favoring. Aversion is the negative form of affect which is described as hating the object, disliking, or destroying it" (1931). Staats (1967) provides a more recent view which emphasizes the affective characteristics of attitudes. He defines attitude as an emotional response to a social stimulus, or a stimulus that has social significance (Fishbein, 1967, p. 373).

Recent attempts have been made to define attitudes in behavioral terms (Elizur, 1970). Dobb (1947) suggests the following

behavioral definition: "attitude is an implicit drive producing response, considered socially significant in the individual's society" (p. 135). A stronger behavioral definition is postulated by Green (1954) which attributes to attitude ". . . a consistency among responses to a specified set of stimuli or social objects" (p. 335). This definition, according to Green, ". . . does divest attitudes of their affective and cognitive properties, which may be . . . correlates of the responses that comprise attitudes . . ." (p. 336).

The systems approach (McGuire, 1969) attempts to merge the cognitive, affective, and conative elements: "As the individual develops, his cognitions, feelings, and action tendencies with respect to various objects in the world, become organized into enduring systems called attitudes . . ." (Elizur, 1970, p. 37). Krech, Cruchfield and Ballachey (1962) utilize this approach and, in their system, the person's feelings, cognitions, and action tendencies "become mutually interdependent." That is, the individual's cognitions "are influenced by his feelings, and action tendencies toward" an object and therefore "a change in his cognitions about the object would tend to produce changes in his feelings and attitude tendencies toward it" (pp. 139-140). They hold that attitudes are "enduring systems of positive or negative evaluations, emotional feelings, and pro or con action tendencies with respect to social objects" (1962, p. 139). However, overt action is not included in this definition of attitudes, but "the social actions of the individual reflect his attitude." They describe the cognitive component as consisting of beliefs about the object, the most important being

"evaluative beliefs" (p. 140). However, because of the interrelatedness of the three attitude components, few attitudes exist in isolation, "most of them form clusters with other attitudes." For instance, what has been called religionism is a cluster which accounts for attitudes toward evolution, God, and birth control.

Some writers regard beliefs about an object as a measure of attitudes. Fishbein and Ravin (1962) suggest a different definition of belief as the probability dimension of the concept: for example, "is it existent or nonexistent, possible or impossible," etc. But of many objects the existence can hardly be doubted. Therefore, Fishbein and Ravin posit that belief about the object must be included (Elizur, 1970). Rokeach (1968) provides a distinction between value and belief: a value is a single global belief, transcending object situation specificity and serving as a standard for judging, acting, valuing, and comparing. Rokeach has defined attitude as a package of beliefs, each of which is object and situation specific, serving as predispositions to act. An attitude is defined as "a relatively enduring organization of beliefs around an object or situation predisposing one to respond in some preferential manner" (Rokeach, 1968, p. 112).

In summary, most of the conceptions of attitudes are multidimensional in character: the affective-cognitive-conative notion is held by perhaps a majority of attitude theorists. The notion in brief is that an attitude is a somewhat enduring system of (a) beliefs, especially evaluative beliefs; (b) positive or negative affect directed toward the object of the attitude and related

objects; and (c) action tendencies regarding the object and its related objects.

Many definitions of attitude, therefore, include the principle that it is a predisposition to act in a certain way or an action tendency. The view of attitude as something which helps to predict a specific overt behavior is criticized by many researchers and theorists. Guttman (1950) states directly that while some variables are predictive of an attitude, they form no part of the attitude. For example, while level of education may help predict a person's resistance to change, it is no part of the definition of attitude toward change (Elizur, 1970). According to this argument, behavior depends not only on the attitude, but also on the situation (Guttman, 1950, pp. 50-51).

Facet Theory Approach to Attitude Measurement

In reviewing the literature, Jordan (1968) concluded that four classes of variables are important determinants, correlates, and/or predictors of attitudes: (a) demographic factors, such as age, sex and income; (b) sociopsychological factors, such as a person's value structure; (c) contact with the object and enjoyment of that contact; and (d) knowledge about the attitude object. In the review, Jordan (1968) concluded that most research studies were inconclusive or contradictory about the predictor variables and suggested that one reason might be that the attitude scales were composed of items stemming from different structures, i.e., from different levels of attitude (for example, the cognitive, affective,

or conative) of the universe of attitudes toward specified objects. The lack of control over which attitudinal "levels" were being measured was projected by Jordan to produce inconsistent, contradictory, and noncomparable findings in attitude research.

Guttman (1953, 1959) developed the use of facet theory to analyze attitude. Facet theory is somewhat similar to factor analysis as used by Thurston and Spearman (Brodwin, 1973) but distinct in its a priori nature. Guttman (1950) operationally defined attitude as "a delimited totality of behavior with respect to something" (p. 51). Guttman's definition of attitude is consistent with the traditional distinction made between attitude and behavior, the difference between the inclination to act and the act itself (Jordan, 1971). Guttman's definition is also consistent with the previous distinctions, since attitude items are considered verbalizations of predispositions. Jordan (1971) used Guttman's definition to link attitude and behavior in the development of his facetized attitude-behavior scales.

Jordan and Guttman (1976) state that it is productive to drop the traditional dichotomy between attitude and behavior and have the term "attitude" embrace both varieties, the predisposition to respond and the response itself, with "subvarieties ranging from stereotypic generalizations to overt and instrumental behaviors which are unfavorable to favorable to any personal or conceptual object" (p. 2).

Initially, Guttman, using a facet theory approach, analyzed the work of Bastide and van den Berghe (1957) and posed four levels

of an attitude universe: (a) stereotypic; (b) norm; (c) hypothetical interaction; and (d) personal interaction. Jordan (1968) expanded Guttman's four levels to six levels by adding the moral evaluation and personal action dimensions.

According to Jordan (1971), Guttman's definition of attitude approximates the "positivistic definition" developed by McGuire (1969, p. 145) and facilitates a cognitive-affective-conative (knowing, feeling, and acting) analysis of the human behavior. According to Jordan, Guttman's definition is consonant with a structural (Foa, 1965, 1968; Foa and Turner, 1970) approach to the facet analysis of attitude-behavior (Jordan, 1971, p. 7). Jordan postulates that ". . . if one is to do research on attitudes that is both socially relevant and methodologically rigorous . . .," Guttman's structural facet theory approach should provide (a) a definition of the research problem; (b) the selection of variables for study; and (c) the structuring of the relationship between the dependent and independent variables.

Consequently, Jordan and his associates have taken a step toward merging the concept of attitude as a "predisposition" to behavior, to include behavior itself. His concept of attitude-behavior and the six attitudinal levels facilitates an examination of the relationship between the cognitive-affective-conative components as well as emphasizes the conative component as the criterion of behavior.

Purpose

The purpose of the present research was to further examine relationships between the cognitive-affective-conative components of attitude across the attitude-behavior levels toward various attitude objects in situation. In this research the use of Guttman's behavioral definition in the context of a more detailed facet theory analysis is presented. The generality of definition is justified by the "first law of attitude" and the growing number of specific empirical laws to which it leads (Gratch, 1973; Jordan, 1971). The first law asserts:

> If any two items are selected from the university of attitude items toward a given object, and if the object observed is not selected artificially, then the population regressions between these two items will be monotone, and with positive or zero sign (Gratch, 1973, p. 36).

This law covers the cognitive-affective-instrumental behavior and thus shows the fruitfulness of considering all three variations as attitudinal (Jordan, 1971).

Guttman (1950) suggests two basic premises for the definition of a scientific concept: "(a) it must be defined in terms of observation; and (b) a definition is scientifically useful only insofar as it leads to objective research" (p. 49). Attitude in this research is regarded as a subclass of behavior and is thus consonant with Guttman's definition of attitude. Thus, attitude is regarded herein as the totality of behavior for or against an object, i.e., it can be observed in a degree of favorableness or unfavorableness of behavior toward the object. The term "attitude object" is used in its widest sense; it may refer to a physical,

social, psychological, various situations and ideas, i.e., everything toward which a person can behave positively or negatively (Elizur, 1970). Regarding an attitude as a totality of behavior "toward an object" allows the term attitude-behavior toward an object to be used interchangeably. In this definition, overt and covert behaviors are part of an attitude, but at different levels, and cover cognitive, affective, and instrumental behaviors (Elizur, 1970).

Guttman's behavioral definition has been enlarged on in the context of the more detailed facet theory analysis developed by Jordan and his colleagues at Michigan State University. The present study is part of a series, all of which have aimed at developing further the facet theory attitude-behavior methodology. Since the inception of Jordan's project approach to graduate research, Attitude-Behavior Scales (ABS) have been developed to assess attitudes toward many "personal" attitude objects, such as Whites toward Blacks, Blacks toward Whites, mentally ill or emotionally disturbed persons, the deaf, the undereducated adult, the blind, the war disabled (in Vietnam), and drug users. Recently, attitude-behavior scales toward "conceptual" objects have been developed: the environment, role of women, technical education, educational change, and affective education (Jordan, 1976).

The validity of the ABS series of scales, using the known group method of establishing concurrent validity, has been successful (Brodwin, 1973; Jordan, 1971, 1974, 1976). The scales have repeatedly discriminated between various groups as predicted by the

theory. Further findings supporting the use of facet theory in predicting correlational structures have also provided support for the construct validity of facet theory.

Limitations of the facet-theory-developed series of ABS scales seems to be involved in the following areas: (a) response set; (b) social desirability; (c) homogeneous item content across the joint levels; (d) combination of facet elements; and (e) the effect of order of scale administration on correlation matrices. These shortcomings, especially (d) and (e) above, have been dealt with by Maierle (1969).

By a theory Guttman means "A hypothesis of a correspondence between a definitional system for a universe of observations and an aspect of the empirical structure of those observations, together with a rationale for such an hypothesis" (Gratch, 1973, p. 35). This can be regarded as stating what Cronback has described as construct validity (Guttman, 1971).

Guttman charges that it is the task of the social theorist to discover the structures underlying the totality of behavior:

> A task of the social theorist is to provide an abstract framework whereby to define the subuniverses; the more adequately it explicates the empirical correlations that ensue among the definitions, the better the framework. Comprehension of the multi-variate system of the universe can lead to larger theories with relation to other universes and thus to more and more perfect multiple correlations for each variety of behavior separately. The improved predictability will not depend on mere empiricism, then, but will be guided by a systematic social theory (p. 318).

Guttman (1959) further states that ". . . to improve the predictability would require enriching the facet design, or placing these

behaviors in a larger context" (p. 327). The research reported herein further explicates the relationship between attitude objects-in-situation across three attitude levels. This was accomplished by measuring attitudes toward selected objects (Blacks, mentally retarded, and blind), holding constant the object-in-situation and the subject-object relationship.

Maierle (1969) proposed the possibility that the two dimensions or structions, joint (that due to attitude level) and lateral (that due to content), interact in ways which were not accounted for in the present methods of simplex analysis and facet design. To date, no studies have examined the interactions of the joint and lateral struction; i.e., how the attitude levels and situations interact across various attitudinal objects.

In summary, the purpose of the present study was to further examine the construct validity of the Guttman-Jordan facet theory approach to the measurement of attitude behaviors: (a) can the relationship be represented in a multi-dimensional model; (b) can the facetized theory discriminate between attitude objects; and (c) what is the joint-lateral interaction when the joint and lateral dimensions are held constant across selected objects.

Fieldman and Hass (1970) provide further justification for the need for the present research: ". . . psychological research paradigm should try to relate what different individuals do in a given situation, to what a given individual does under different conditions." In this project, the situations (life situations) were held constant and the different "treatment" conditions were

represented by three attitudinal objects. Furthermore, according to Jordan (1971), structioned variables should provide a set of clearly defined profiles for "cross-object, cross-situations, cross-national, and sub-cultural comparisons . . . ." And Krech, Cruchfield and Ballachey (1962) provide a final justification: "few attitudes exist in a state of isolation; most of them form clusters with other attitudes" (p. 145).

In accordance with Guttman's proposal (1959, p. 327), an attempt was made to increase the facet design by incorporating more and wider facets of attitude and placing the behaviors in a broader context. Thus, an attempt is made to treat the theory as Jordan and Guttman (1976) suggest: "a theory for all variables simultaneously must account for variations over lateral and content facets, as well . . . ."

CHAPTER II

FACET DESIGN, STRUCTURAL THEORY, AND ATTITUDE MEASUREMENT

> Definitions are, of course, arbitrary. Following Louis Carroll, one can make words mean what one wishes. Basically, all that is formally required of a definition is that it be clear: that it enables reliable use of the concept concerned. A more formal, heuristic desideratum is that it actually influences theorists and researchers to progress in their work (Guttman, 1971, p. 329).

Guttman (1955, 1959) developed facet theory as a tool or strategy in defining a research problem and in theory development. In social research there are usually two sets of variables: the population and a set of attributes or qualitative variables (Elizur, 1970). The attributes represent what Guttman refers to as the universe of content of the investigation. Facet theory provides a means by which a systematic design of the universe of content is obtained, and therefore, facilitates the formalization of hypotheses regarding the relationship between the definitional system and the structure of the empirical observations (Elizur and Guttman, 1976).

According to Guttman, the use of the structural approach to the development of psychological theory is becoming increasingly widespread. He defines a theory as:

> An hypothesis of correspondence between a definitional system for a universe of observations and an aspect of the empirical structure of those observations, together with a rationale for such an hypothesis (Gratch, 1973, p. 35).

This definition emphasizes the necessity of defining the universe of observations to be researched, and also stipulates that the definitional system should be in a form that facilitates perception of correspondence with empirical data (Levi, 1976).

Facet theory, as developed by Guttman and his associates, is a metatheory for the design of structural and other theories (Elizur, 1970). Furthermore, new innovations in non-metric measurement methodology also provide a means for quantifying the qualitative data of facet analysis and testing the structure of the data to indicate if it reveals the postulated statistical structure (Elizur, 1970). There are three basic constructs in facet theory: subjects or respondents (called the population and designated by P), the variables (attributes of the population), and categories (the subclasses of the variables) (Kats, 1972). Each variable (facet) studied can be conceived of as a subuniverse of the total universe, where the total universe is all aspects of the universe (or theoretical) problem.

The collection of facets (variables) can be linked together via a mathematical statement of sets: ABC . . . . Each facet is conceived of as having "structs," members, or elements (See Appendix A, Glossary). The notation of facets is by capital letters and the elements of each facet are denoted by lower case letters. For example, facet A has elements a_1, a_2, . . . a_m. Elements of the facets are combined to form profiles (structuples). For example, facets A and B may each have two elements and therefore there are four possible profiles: $a_1\ b_1$; $a_2\ b_1$; $a_1\ b_2$; and $a_2\ b_2$. The

universe of content is defined as the collection of all possible profiles over the facets and their elements (Kats, 1972). Consequently, all variables included in the analysis form a universe of content and each variable can be defined as a profile of elements where each element belongs to one of the facets which defines the universe (Guttman, 1959; Elizur, 1970; Kats, 1972).

In summary, each investigation concerns a set of variables (facets denoted by capital letters), a population (denoted by P), and a range of categories (responses denoted by R and expressing a common range). The combination of facets forms a profile, where each element is a "struct" and the elements together form a "structuple." Structuples mean the same as "profile" (Elizur, 1970). Thus, if a research problem has two facets, each with two elements, as in the example above, a structuple would be a_1 b_1 and each element would be a struct.

To enable representation of a total design, Guttman developed the technique of the "mapping sentence," which represents the relation in the following form: P AB $\rightarrow$ R. In this mapping, the relations are mapped into a domain (population and variables) and a range (category of responses). The mapping provided above is a summary notation which says that for each respondent (an element, facet P), in a reaction to a question (a variable or structuple of facets) "implies" one answer in terms of categories (an element of the range, facet R) (Kats, 1972). The arrow as used by Guttman does not imply a causal relation: only that "if what is specified in

the domain is true, the specification of the range is true" (Elizur, 1970; Kats, 1972).

The complete mapping sentence is the equivalent of more formal expression as used in set theory notation; and the mapping sentence presents the complete research design (Elizur, 1970). Conceptually, the mapping of facets permits the inclusion of all facets that are theoretically possible, and all possible structuples. In order to facilitate communication and translation of the concept represented in the mapping sentence, Guttman proposed utilizing a standard grammatical sentence form by adding verbal connectives between facets (Guttman, 1965).

In brief, Guttman's mapping sentence serves two purposes: (a) it provides a definition of the universe of obserations and (b) it provides the relation in a form that aids systematic perception of the relationship (Levi, 1976). In effect, the mapping sentence is a basic technique in facet theory (Elizur and Guttman, 1976).

By specifying in a mapping sentence the basic facets (or variables) which may, in part, influence, determine, or effect a response, a researcher is forced to thoroughly consider the aspects of his theory or research problem. Thus a strategy of "extension and intension" of theory is an important feature of facet theory: ". . . heuristic strategies are possible through mapping sentences, since they easily lend themselves to correction, deletion, extension, and intension" (Levi, 1976). The advantage of facet theory lies in the capability of defining the components of a research

problem and in formalizing the process. In comparison to traditional factorial design, Guttman and Guttman (1975) state the following:

> . . . what may be regarded as a complete design for the purposes of analysis of variance (and other statistical analysis) turns out to be incomplete for at least two more basic purposes: (a) theory construction and (b) conducting the original observations which are to be subjected to the data analysis.
>
> The mapping sentence device is intended to make the experimental design more complete. In addition to the facets of the factorial design it brings out explicitly certain other basic features required of the original observation. The mapping sentence gives more specific instructions on how to make empirical observations, and in this sense provides the definitional framework for these observations. Given such a more detailed framework, it facilitates theory development (p. 3).

Guttman's Post Hoc Facetization of an Attitude Research Problem

In 1959, Guttman reanalyzed a design by Bastide and van den Berghe (1957), and abstracted, via facet theory, four subuniverses of attitudes which they had not explicitly designated. Bastide and van den Berghe had assessed interracial behavior in Brazil, and described the following four types of attitudes: stereotypes, norms, hypothetical interaction, and personal interaction. They had presented the intercorrelations among the four types of attitudes. From a reanalysis of the data, Guttman developed a structural theory for intergroup beliefs and actions through the facet definition of the same universe of content. In his facetization, Guttman defined three facets; each, in turn, with two elements:

1. the behavior
   - a_1 beliefs
   - a_2 overt action

2. the referent to whom the behavior is ascribed
   b_1 the subject's group
   b_2 the subject himself

3. the type of behavior
   c_1 comparative
   c_2 interactive

The Cartesian product of these three facets permits eight possible structuples with three structs each: $a_1\ b_1\ c_1$; $a_1\ b_1\ c_2$; . . . $a_2\ b_2\ c_2$. An example of the $a_1\ b_1\ c_1$ reads: belief (a_1) of a subject that his own group (b_1) interacts (c_2) with a specified attitude object. Similarly, the structuple $a_2\ b_2\ c_2$ reads as follows: self or observed reports of a subject's overt action (a_2) of himself (b_2) interacting (c_2) with specified attitude object.

There is an ordering of these facets in the design; Guttman refers to it as a progression from weak to strong forms of behavior vis-à-vis the attitude object. Ideally, within each facet the elements can be ordered from weak to strong forms of behavior and the higher the subscript, the stronger the behavior. For example, overt action (a_2) is stronger than belief (a_1). This principle of ordering has important implications which will be explored below.

Thus, according to the facetization of Bastide and van den Berghe's data, eight subuniverses were possible:

1. $a_1\ b_1\ c_1$ Stereotype: Belief (a_1) of a subject that his own group (does not excel) in comparison (c_1) with Negroes
2. $a_1\ b_1\ c_2$ Norm: Belief (a_1) of a subject that his own group (b_1) ought (ought not) to interact (c_2) with Negroes

3. $a_1\ b_2\ c_2$ Hypothetical interaction: Belief (a_1) of a subject that he himself (b_2) will (will not) interact (c_2) with Negroes
4. $a_2\ b_2\ c_2$ Personal interaction: Overt action (a_2) of the subject himself (b_2) to (not to) interact (c_2) with Negroes
5. $a_1\ b_2\ c_1$ Feel superior
6. $a_2\ b_2\ c_1$ Act superior
7. $a_2\ b_1\ c_1$ Teaching
8. $a_2\ b_1\ c_2$ Preaching

As mentioned above, Guttman showed, through facet analysis, that Bastide and van den Berghe had intuitively arrived at four of the possible eight subuniverses and had not investigated the remaining four. Thus Guttman showed that, had the original investigators been guided by facet procedures in the design of their study and analysis of their data, they would have known in advance ". . . what to search for, how to test it, and what significance to subscribe to their results" (Elizur, 1970, p. 47).

Structural Relations Specified by Facet Procedures

Guttman's definition of a theory as quoted by Gratch (1973, p. 11) specifies a correspondence between empirical observations and a definitional system. Two related principles have been used in specifying this correspondence: the first is the proximity principle (formerly called the contiguity hypothesis) which states that:

> subuniverses which are closer in their facet construction will also be closer statistically (Elizur, 1970, p. 58).

According to this principle, the relationship between structuples decreases as the number of similar structs decreases. For example, eight possible structuples were specified by Guttman's facetization of Bastide's and van den Berghe's data. According to the proximity principle, the relation between the structuple a_1 b_1 c_1 and a_1 b_1 c_2 would be higher than the relationship between a_1 b_1 c_1 and a_2 b_2 c_2. However, the real relationship depends on the theoretical weight given by the "facets, elements, or their combinations" (Kats, 1972, p. 41).

The second principle is that of structural order. In this principle, ordered proximities (structures) is important. Order is presumed to exist between elements of facets (structs) and between different structuples. As the structuples combine with increasingly stronger elements from the facets, the total structuple can become stronger. For example, stereotypic is weaker than personal interaction, and personal interaction is the strongest profile which Bastide and van den Berghe defined. The concept of order or lawfulness leads to prediction of empirical structures from ". . . consideration of order within elements of the facets concerned" (Elizur and Guttman, 1976, p. 2); lawfulness here refers to geometric properties of obtained correlation matrices.

Since the mapping sentence enables one to project the empirical relationship between structuples, Guttman and his associates have discovered several forms of structural relationships.

The discovery of structural order or lawfulness is one of the challenges to the social psychologist:

> Recognizing that differential relations exist within and between variations of behavior, the challenge to the social psychologist is to reveal what structural system, if any, underlies all of these relations (Guttman, 1959, p. 318).

Since Guttman and associates have found that correlation structures remain relatively unchanged over time and circumstances (Guttman, 1964; Guttman and Levi, 1970), whereas means or averages are subject to considerable variation, it seems only reasonable to expend considerable effort to discovery of structural lawfulness.

The "simplest" form of structural order is the simplex (Guttman, 1954). The simplex is a statistical structure of intercorrelations which reveals a "simple order of complexity" (Guttman, 1954, p. 260). The simplex is determined by the fact that the "highest correlations lie along the main diagonal where the features are closer together in their a priori order and taper off toward the upper right and lower left corners of the matrix, where there is the greatest difference in the a priori order" (Guttman and Guttman, 1965, p. 220). Table 1 portrays a simplex structure with four variables.

In his search for a single-common-factor which shows order among variables, Guttman states the following about simplex structure:

> Suppose we are given n tests t_1, t_2 . . . t_n which differ only on a single complexity factor . . . . Test t_1 is the least complex. Test t_2 is the next; it requires everything t_1 does and more. Similarly, t_3 is more complex than t_2, requiring everything t_2 does and more . . . . In this

TABLE 1.--Simplex Structure of Correlation Matrix.[1]

Variable	1	2	3	4
1	1.0	High	Lower	Lowest
2	High	1.0	High	Lower
3	Lower	High	1.0	High
4	Lowest	Lower	High	1.0

[1]Adapted from Elizur (1972, p. 59).

> case, t_3 is also clearly more complex than t_1. In general, test $t_j + 1$ is more complex than t_j, and hence requires what all preceding tests require plus something more. Let G denote the total complexity factor, of which all the tests are composed in various degree. Thus, G is like an additional test beyond the most complex given test t_n . . . (1954, p. 269).

Given the order of complexity, it seems only reasonable to expect that the correlation between t_1 and t_2 would be higher than between t_1 and t_n, given the fact that t_1 and t_2 differ only in order of complexity. Thus Guttman (1954) is able to specify the perfect simplex. In reality, the perfect simplex rarely exists, but the principle of order among the variables is finding increasing support (Brodwin, 1973; Elizur, 1970; Gottlieb, 1973; Guttman, 1954; Jordan, 1971; Kats, 1972). This simplex structure has been shown to be a factor pattern (Guttman, 1954). In a geometrical sense, a simplex may be thought of as a collection of points along a straight line (Elizur, 1970); in content, the simplex implies differences of degree (Kats, 1972).

The circumplex structure involves the law of proximity as does the simplex (those structuples closer to each other in their facet design will correlate higher), but there is a circular order to the correlations: i.e., "a circular order of complexity" (Guttman, 1954, p. 260). In the circumplex the strongest correlations occur along the main diagonal and decrease in size as they move away. However, toward the corners of the matrix the correlations increase again, which makes the total picture one of circular order. It is possible to see a circular order among the variables by direct inspection of the coefficients of monotonicity (the correlation coefficient). Table 2 provides a hypothetically perfect circumplex structure of correlations.

TABLE 2.--Intercorrelations for an Equally Spaced, Uniform, Perfect, Additive Circumplex.[1]

Test	t_1	t_2	t_3	t_4	t_5	t_6
t_1	1.00	.75	.50	.25	.50	.75
t_2	.75	1.00	.75	.50	.25	.50
t_3	.50	.75	1.00	.75	.50	.25
t_4	.25	.50	.75	1.00	.75	.50
t_5	.50	.25	.50	.75	1.00	.75
t_6	.75	.50	.25	.50	.75	1.00
Total	3.75	3.75	3.75	3.75	3.75	3.75

[1]Adapted from Guttman (1954, p. 329).

In a perfect circumplex, the column totals will be equal. A quasi-circumplex is defined as a perfect circumplex plus deviations (Guttman, 1954); and a quasi-circumplex is in reality usually obtained.

The radex involves both the simplex and circumplex. Given two facets in a design where facet A has three levels and facet B has three levels (i.e., there are nine possible structuples), facet A may be an unordered facet and facet B an ordered facet. If these constraints are true, a radex would be the expected outcome. Figure 1 provides a pictorial representation of the hypothetical radex, where facet A plays a polarizing role and facet B a modulating role. The polarizing effects of elements of facet A is to separate the

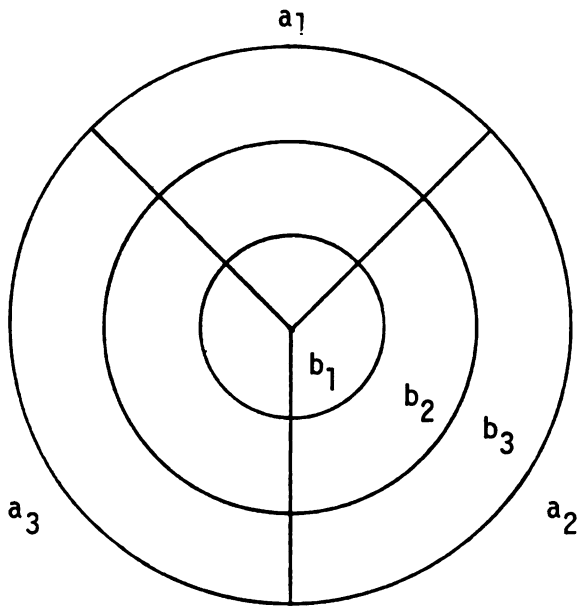

Figure 1.--A Diagram of a Hypothetical Radex.

space into regions, each of which emanate from the origin and radiate outward, each in its own direction. The modulating effect of the elements of facet B is to modulate the distance from the origin. If one were to hold constant one of the elements of facet B, then a circumplex would result. Likewise, if one were to hold constant one of the elements of facet A a simplex would result. Thus a radex is a form of lawfulness which Guttman called "radial expansion of complexity" (1954, p. 260); in the example provided above, facet B elements formed concentric circles and facet A elements formed the segments.

A cylindrex or a three-dimensional representation of correlations is defined as a two-dimensional radex and an axis orthogonal to it. A radex is a circular arrangement in a plane, and the axis perpendicular to it defines a cylindrical configuration. An axial element or facet would also involve elements which would be ordered, and the orders would be represented along the axis of the cylinder (Levi and Guttman, 1975). Therefore, three facets are required to form a cylindrex. Two play roles in the radex; one would polarize and the second would modulate, and the third facet specifies orders along the axis. Figure 2 provides geometric representation of a cylindrex with three facets, each having three elements. As in Figure 1, facet A is a polarizer and facet B a modulator and facet C acts as an axial factor.

These structural hypotheses have received wide support: in mental abilities (Guttman, 1964), worry (Levi and Guttman, 1975), and attitudinal measurement (Jordan, 1971; Jordan and Guttman, 1976).

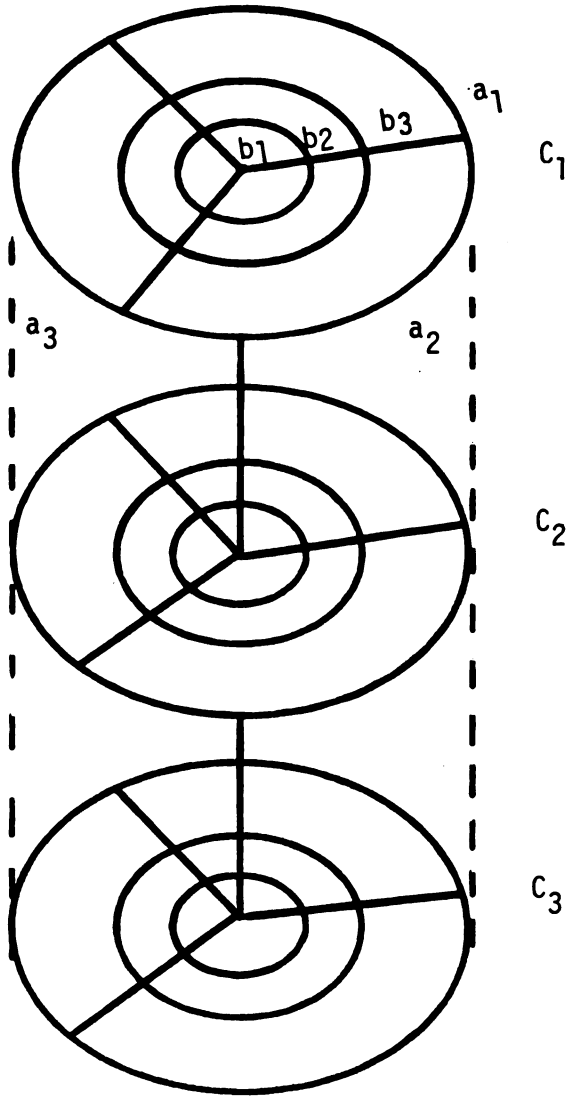

Figure 2.--A Hypothetical Cylindrex.

Other structural relations and lawfulness are currently being obtained and evaluated at the Israeli Institute of Social Research. Indeed, Guttman's 1954 speculation about other possibilities of further lawfulness, given the notion of order among the variables, implied a facet design.

> Also, once we focus on the notion of order amongst variables, alternative theories of order are possible . . . even in a plane . . . a part from those of the symplex, circumplex, and radex. One can imagine ex-strings of the elementary components, with loops in them, etc. (Guttman, 1954, p. 240).

Nonmetric Analysis: Examination of Structural Order and Lawfulness

Guttman's definition of a theory (in Gratch, 1973, p. 35, and quoted on page 13) states that a theory is a correspondence between a definitional system (facet theory in this research) and the empirical structure of observations, together with a rationale for the hypothesis. His definition emphasizes that the structure of the relations will be specified by the facet design and as shown above by the ordering principles. Guttman (1968) and Lingoes (1973) have developed a series of nonmetric techniques which have proven to be useful in portraying the structure or lawfulness involved in correlations or other "distance" functions.

Most of the earlier methods used to study relationships between many variables are subject to the constraints (assumptions) of least squares analysis. The Smallest Space Analysis (SSA) method departs from strictly metric assumptions and replaces these by ordinal assumptions. SSA-1 is the first of a series of methods which are

based on ordinal distance models (Euclidean geometric relations) for the analysis of data matrices; these apply transformations of coefficients of monotonicity. Thus, SSA-1 is specifically designed for spatial representation of symmetric matrices of similarity or dissimilarity coefficients, such as correlation coefficients (Guttman, 1966, 1967, 1968; Lingoes, 1965, 1966, 1968, 1973; Lingoes and Roskam, 1971).

SSA-1 calculates coordinates for points representing variables such that the distance points reproduce the rank order of the association values (between variables) according to a criterion of fit--the monotonicity criterion; and reproduce the smallest possible dimensionality in a Euclidean space. In its simplest sense, SSA-1 portrays physical and spacial distance between variables as represented by the correlation coefficients. For example, if the correlation between variables X and Y is +1.0, then they would occupy the same space. If the relationship was -1.0, then they would be far apart in the space. Adding the correlation of X and Y with a third variable, Z, to the space would result in SSA representing the distance between all three variables. If the correlation between X and Y was -1.0; between X and Z, 0.0; and between Y and Z, 0.0, then a one-dimensional space of a straight line would represent the relations. The result is a configuration of points (variables) based on the sizes of the correlations or other distance functions between all variables. Reproduction of the values of the correlations is not the sole aim; only ordinal restrictions are imposed upon the solution, which is why it is called a nonmetric approach (Kats,

1972). The configuration of plotted points is essentially the objective of the analysis; this contrasts with factor analysis in which the coordinates of each point are interpreted as factor loadings after acceptable rotations of factors have been determined.

Thus, smallest space analysis attempts to use as few coordinates as possible, a minimal number of dimensions, to acquire an adequate representation of the rank order of relations and the configuration of points: the smallest space. The program searches in an iterative process for the most adequate configuration of points in that number of dimensions of smallest space.

Since fewer dimensions are needed to reproduce order information than metric information, SSA-1 results in a simpler and more direct data representation, and therefore is viewed as a more parsimonious method (Guttman, 1966; Lingoes, 1966). It is also more parsimonious than factor analysis (Schlesinger and Guttman, 1969). While factor analysis and smallest space analysis will produce the same basic structure of data (Kats, 1972), SSA usually renders fewer dimensions than factor analysis, i.e., a smaller space than factor analysis of the same data (Elizur, 1970).

In one example, a smallest two-dimensional space was equivalent to a six-dimensional factor space (Guttman, 1966). Schlesinger and Guttman (1969) reanalyzed existing data in which factor analysis (by the orthogonal method) had obtained a six-factor space. Through SSA-1 they found that the data could be represented in a two-dimensional space and preserve the basic structure obtained in

factor analysis. From this comparison with factor analysis, Schlesinger and Guttman (1969) concluded the following:

1. Smallest Space Analysis makes it possible to arrive at a smaller space than does factor analysis. In the empirical example of this paper, a two-space has been shown to portray adequately data for which six factors had been extracted by factor analysis.
2. The configuration of points revealed by Smallest Space Analysis corresponds essentially to that yielded by factor analysis. Indeed, the factors extracted by factor analysis can be represented by points in the smallest space.
3. The notion of coordinates is not essential. It is suggested that an analysis of test content in terms of definitional facets may lead to more fundamental insights into laws of formation of the structure of correlation matrices.

In SSA-1, the concept of dimension has nothing to do with the content of the data; it represents the smallest space in which the configurations can be shown. The facet design, taken together with the ordering principles and structural hypothesis, attaches meaning to the obtained structure. The tendency to look for meaning in the dimensions and coordinates of the dimensions is virtually meaningless without taking into account the facet design and content of the data. In contrast to factor analysis the meaning is attached a priori, via the facet design.

The coefficient of alienation shows the degree of fit of the solution and measures the deviation between input coefficients and the reproduced distances. This coefficient ranges from 0 to 1 in such a way that the better the fit between the data matrix and the configuration, the closer to zero it becomes. For a two-dimensional space, a fit of .15 is thought acceptable, but for several reasons is not an absolute criterion. A more important guideline is the

interpretation of the configuration in terms of facet design and content; at times the rule of a technically perfect fit has been violated in favor of content interpretation.

SSA-1 analysis reflects a quest for ordered structures; its interpretation stresses the configuration of data and rank order among relations rather than their absolute size. These ideas were first elaborated upon by Guttman in radex theory, with facet design as the theoretical framework for predicting and interpreting such data structures (Guttman, 1954, 1959, 1965, 1966). Generally, the interpretation is done graphically.

Facet Theory and Attitude Measurement

While Guttman proposes that "all of human behavior towards social objects can be divided into subuniverses . . ." (Guttman, 1959), he is more concerned with specific patterns of behavior than the possible underlying characteristics of individuals (Maierle, 1969). As shown above, facet theory is a method for the design of structural and other theories and new innovative nonmetric methodology provides a means for facet analysis and for testing of structural hypotheses generated by the facet design (Elizur, 1970). This is truly the sense of a theory as Guttman defines a theory.

Guttman (1959) distinguished three "facets" involved in a particular attitude response: facet A, the subject's behavior (a_1 belief vs. a_2 overt action); facet B, the referent (b_1 the subject group vs. b_2 the subject himself); and facet C, referent behavior (c_1 comparative vs. c_2 interactive). He further postulated

an ordering principle from weak to strong forms of behavior: i.e., the elements of the facets are ordered and as the structs become stronger, the strength of the structuple becomes stronger. Thus, all attitude items can have none, one, two or three strong structs; a total of four possible combinations from weak to strong structs. Guttman's theory showed a logical reason for only four permutations. If the elements of the facets are properly ordered within each facet and the facets are correctly ordered with respect to each other, then analysis of attitude items by n-dichotomous facets will produce n + 1 types of attitude items. These types are called "levels" where each "level" has one more strong element than the "level" preceding it and one less strong element than the "level" immediately following it. In Guttman's reanalysis of Bastide and van den Berghe's (1957) attitude research, Guttman arrived at eight subuniverses, at four levels.

Thus, Guttman's (1959) facet analysis of Bastide and van den Berghe's data allowed for three facets and hence four levels of attitude. Guttman (1959) also suggested that to increase the predictability of his theoretical model, it would be beneficial to (a) enrich the facet design and (b) place these behaviors (levels) in a broader context. In the latter 1960s and early 1970s, further application of facet theory to attitude measurement was undertaken by Jordan and others at Michigan State University. At first, Jordan utilized a facet design to construct a universe of attitude items toward the mentally retarded (Jordan, 1968). Jordan (1968) projected

that there were other pertinent facets, and accepting those identified by Guttman, he expanded the facet analysis of attitudes to include five facets and therefore six levels. Table 3 provides Guttman's original facets and Jordan's adaptation. Specifically, Jordan added facets which defined two more levels at the lower end of Guttman's original levels (Brodwin, 1973).

According to Guttman, an item (a structuple from a complete mapping sentence) belongs to the universe of attitude items if the following constraints are true:

> an item belongs to the universe of attitude items if and only if: its domain asks about behavior in
> a { cognitive / affective / instrumental } modality toward an object,
> and its range is ordered from { very positive / to / very negative }
> toward that object (in Gratch, 1973).

Guttman's original attitude levels (stereotype, norm, hypothetical interaction, and personal interaction) were primarily concerned with the cognitive and affective modalities (McGuire, 1969). It is at this point that Jordan visualized the need to expand Guttman's system to include conative modalities; his six-level facetized design gave greater emphasis to the affective and conative elements of "attitude behaviors" than does Guttman's original four-level design, thus the term "attitude-behavior." Jordan's additional levels actually emphasized real, observable, experienced, and/or reported behavior. These levels evaluate the subjects' actual feelings and actions, instead of perceived thoughts, beliefs, and opinions.

TABLE 3.--Comparison of Guttman and Jordan Facet Designs for Attitude Items.

Design	Facets in Jordan Adaptation				
	A	B	C	D	E
Jordan	Referent	Referent behavior	Actor	Actor's intergroup behavior	Domain of actor's behavior
	a_1 others	b_1 belief	c_1 others	d_1 comparison	e_1 hypothetical
	a_2 self (I)	b_2 experience (overt behavior)	c_2 self (mine/my)	d_2 interaction	e_2 operational
Guttman	- - -	Subject's behavior	Referent	Referent's intergroup behavior	- - -
	- - -	b_1 belief	c_1 subject's group	d_1 comparative	- - -
	- - -	b_2 overt action	c_2 subject himself	d_2 interactive	- - -

They appear to be crucial levels where attitude change is concerned (Brodwin, 1973). Table 3 provides the facet design developed by Guttman (1954), compared with the modified facet design developed by Jordan (1968).

By specifying five facets, with two structs each, Jordan's modification results in 32 possible structuples. Maierle (1969) developed a set of logical rules and showed that 12 of the 32 combinations were semantically consistent. Table 4 provides the 32 possible structuples, and Table 5, combinations of the two element facets and Maierle's basis for elimination. Maierle (1969) also presented an extensive discussion of the specific rules for elimination and the rationale for choosing 6 of the 12 structuples to form the 6 attitude levels. Table 6 provides the 6 levels combined with the original 12 possible semantically logical and consistent profiles.

Construction of the six-level attitude behavior scale in Jordan's research has been guided by the facet elements shown in Table 7. These six structuples were chosen because they appeared to be capable of instrumentation and were considered socially relevant (Brodwin, 1973). In addition, these six levels form a simplex: each structuple becomes increasingly stronger with one more strong struct; i.e., they move from no strong elements to all strong elements.

The mapping sentence for the above five facets outlines the possible levels at which attitude may be measured, asserted, or implied toward all possible attitude objects (both personal and

TABLE 4.--Permutations of Five Two-Element Facets[a] of Table 3.

Permutations	Facets[b]				
	A	B	C	D	E
1	1	1	1	1	
2	1	1	1	2	1
3	2	1	1	1	1
4	2	1	1	2	1
5	1	1	2	1	1
6	1	1	2	2	1
7	2	1	2	1	1
8	2	1	2	2	1
9	1	2	1	1	1
10	1	2	1	2	1
11	2	2	1	1	1
12	2	2	1	2	1
13	1	2	2	1	1
14	1	2	2	2	1
15	2	2	2	1	1
16	2	2	2	2	1
17	1	1	1	1	2
18	1	1	1	2	2
19	2	1	1	1	2
20	2	1	1	2	2
21	1	1	2	1	2
22	1	1	2	2	2
23	2	1	2	1	2
24	2	1	2	2	2
25	1	2	1	1	2
26	1	2	1	2	2
27	2	2	1	1	2
28	2	2	1	2	2
29	1	2	2	1	2
30	1	2	2	2	2
31	2	2	2	1	2
32	2	2	2	2	2

[a]Subscript "1" indicates weak element; "2" indicates strong element.

[b]See Table 3 for facets.

TABLE 5.--Combinations of Five Two-Element Facets and Basis of Elimination.

Combinations			Facets and Subscripts					Basis[b] of Elimination			
No.[a]	In Table 6	In Table 7	A	B	C	D	E				
1	1	Level 1	o	b	o	c	h				
2	2	Level 2	o	b	o	i	h				
3	3	--	i	b	o	c	h				
4	4	Level 3	i	b	o	i	h				
5	5	--	o	b	m	c	h				
6	6	--	o	b	m	i	h				
7	7	--	i	b	m	c	h				
8	8	Level 4	i	b	m	i	h				
9	--	--	o	e	o	c	h		2		
10	9	--	o	e	o	i	h				
11	--	--	i	e	o	c	h	1	2		
12	--	--	i	e	o	i	h	1			
13	--	--	o	e	m	c	h	1	2		
14	--	--	o	e	m	i	h	1			
15	--	--	i	e	m	c	h		2		
16	10	Level 5	i	e	m	i	h				
17	--	--	o	b	o	c	p			3	4
18	--	--	o	b	o	i	p				4
19	--	--	i	b	o	c	p			3	4
20	--	--	i	b	o	i	p				4
21	--	--	o	b	m	c	p			3	4
22	--	--	o	b	m	i	p				4
23	--	--	i	b	m	c	p			3	4
24	--	--	i	b	m	i	p				4
25	--	--	o	e	o	c	p		2	3	
26	11	--	o	e	o	i	p				
27	--	--	i	e	o	c	p	1	2	3	
28	--	--	i	e	o	i	p	1			
29	--	--	o	e	m	c	p	1	2	3	
30	--	--	o	e	m	i	p	1			
31	--	--	i	e	m	c	p		2	3	
32	12	Level 6	i	e	m	i	p				

[a]Numbering arbitrary, for identification only.

[b]Logical semantic analysis as follows:

Basis 1: an "e" in facet B must be preceded and followed by equivalent elements, both "o" or "i" in facet A or "m" in facet C.

Basis 2: a "c" in facet D cannot be preceded by an "e" in facet B.

Basis 3: a "c" in facet D cannot be followed by a "p" in facet E.

Basis 4: a "p" in facet E cannot be preceded by a "b" in facet B.

TABLE 6.--Five-Facet Six-Level System of Attitude Verbalizations[a]: Levels Facet Profiles, and Definitional Statements for Twelve Combinations.

Level	Facet Profile	No. in Table 21	No.[b]	Definitional Statement[c]		Descriptive Name[d]
1	o b o c h $a_1 b_1 c_1 d_1 e_1$	1	0	Others believe others' comparisons hypothetically	**	Societal stereotype (group-assigned group status)
2	i b o c h	3	1	I believe others' comparisons hypothetically		Personally assigned group status
	o b o i h $a_1 b_1 c_1 d_2 e_1$	2		Others believe others' interactions hypothetically	**	Societal norm
	o b m c h	5		Others believe my comparisons hypothetically		Group-assigned personal status
3	i b o i h $a_2 b_1 c_1 d_2 e_1$	4	2	I believe others' interactions hypothetically	**	Personal moral evaluation (perceived values)
	i b m c h	7		I believe my comparisons hypothetically		Self-concept (personally assigned personal status)
	o b m i h	6		Others believe my interactions hypothetically		Proclaimed laws (group expectations)
	o e o i h	9		Others experience others' interactions hypothetically		Group identity (actual group feelings)
4	i b m i h $a_2 b_1 c_2 d_2 e_1$	8	3	I believe my interactions hypothetically	**	Personal hypothetical action
	o e o c h	11		Others experience others' comparisons hypothetically		Actual group action
5	i e m i h $a_2 b_2 c_2 d_2 e_1$	10	4	I experience my interactions (feelings) hypothetically	**	Personal feeling
6	i e m i p $a_2 b_2 c_2 d_2 e_2$	12	5	I experience my interactions (overt behavior) operationally	**	Personal action

** Combinations used in the ABS.

[a] Cf. Table 3.

[b] No. = number of strong elements in level.

[c] Words in parentheses are part of redundant but consistent statements.

[d] Alternate names in parentheses indicate relationships of various level members.

TABLE 7.--Joint Level, Profile Composition, and Labels for Six Types of Attitude Struction.[a]

Subscale Type-Level	Profile by Notational[b] System in Table 17	Profile by Definitional System in Table 22	Attitude Level Descriptive Term
1	o b o c h	a_1 b_1 c_1 d_1 e_1	Societal stereotype
2	o b o i h	a_1 b_1 c_1 d_2 e_1	Societal norm
3	i b o i h	a_2 b_1 c_1 d_2 e_1	Personal moral evaluation
4	i b m i h	a_2 b_1 c_2 d_2 e_1	Personal hypothetical action
5	i e m i h	a_2 b_2 c_2 d_2 e_1	Personal feeling
6	i e m i p	a_2 b_2 c_2 d_2 e_2	Personal action

[a]Based on facets of Table 3.
[b]See Table 6 for definitional statements, facets, and subscript profiles.

conceptual objects). These possible levels (the six agreed-upon levels are provided in Table 7) form what Guttman and Jordan have labeled joint struction; i.e., the structioning that occurs across attitude levels for all possible attitude objects. The researcher may assess attitudes at any or all of these joint structioned attitude levels for any attitude object. And the researcher may assume that the individual respondent or group of respondents will provide different responses to the same item dependent upon which joint level the question is presented.

The individual item for each level is not determined by the mapping sentence provided thus far. Concentration to this point has been on the joint (subject-object relationship) structioned level. By adding to the mapping sentence what Jordan calls relevant situations (i.e., placing the object of the attitude at a particular joint level and in a particular situation), the mapping sentence can be considered to be complete. This latter addendum to the mapping sentence has been labeled lateral struction, which is that dealing with the particular attitude object-in-situation. Figure 3 provides the mapping sentence for the first scale developed by Jordan (1968): Attitude-Behavior Scale-Mental Retardation (ABS-MR).

In summary, Guttman's facet theory specifies that the attitude universe represented by the item content can be sub-structured into profiles which are related according to the number of identical semantic elements they hold in common. This structuring will facilitate the sampling of items within each of the joint levels and lateral situations and will enable the prediction of relationships

JOINT STRUCTION

	(A) Referent		(B) Referent Behavior		(C) Actor		(D) Actor's Intergroup Behavior	(E) Domain of Actor's Behavior
(Subject attributes to)	a_1 others a_2 self	who has	b_1 belief b_2 experience (overt behavior)	vis-à-vis the actor	c_1 others c_2 self (mine/my)	that the actor	d_1 compare(s) d_2 interact(s)	e_1 hypothetically e_2 operationally

LATERAL STRUCTION

	(F) Life Situations		(G) Importance		(H) Evaluation Process	
(with the mentally retarded in)	f_1 personal traits f_2 primary group relations f_3 recreation f_4 education f_5 employment f_6 health, welfare and legislation f_7 sex and family f_8 secondary group relations	(involving)	g_1 high g_2 medium g_3 low	(level of importance)	h_1 with respect to h_2 because of h_3 despite	(their)

RESPONSE MODE STRUCTION

(I) Trait Type	(J) Trait Level		(K) Valence		(L) Intensity	
i_1 cognitive i_2 affective i_3 physical-behavioral	j_1 attributed handicap j_2 actual disability	$\longrightarrow$ with	k_1 negative k_2 neutral k_3 positive	(valence and)	l_1 low l_2 medium l_3 high	intensity.

Figure 3.--A Mapping Sentence of the Joint, Lateral, and Response Mode Struction Facets Used to Structure the Attitude-Behavior Scale-Mental Retardation.

between the profiles of the universe. While joint struction has an ordering principle established, to date little has been accomplished in ordering the lateral content in an explicit a-priori manner.

The rationale used in the item content of previous ABS scales has attempted to "order" the content (lateral dimension) via three principles:

1. Ego involvement: cognitive-affective. Is the "attitude object-in-situation" dealt with cognitively or affectively?

2. Social distance: distant-close. Is the "attitude object-in-situation" distant or close to one's self?

3. Relevance: low-high. Is "situation" relevant and/or important to the subject?

Consistent with the discussion of the weak-strong principles, a positive or stronger attitude would be expressed by a subject who "agreed with or chose" items that dealt with the attitude object in "highly important situations that involved the self in close personal interaction" (Brodwin, 1973).

There are two types of data analyses which have previously been utilized: (a) analysis of facets across the joint levels; i.e., determination of simplex relationships, and (b) analysis of the nature of the content within each of the six subscales. The simplex analysis deals with the joint dimension, and analysis of the content deals with the lateral dimension (Jordan, 1968).

Jordan (1976) states that facet theory can be used in stating a problem; structuring the relationships among the variables and between variables; dealing with the problems of relevancy,

equivalency, and comparability across groups; and assisting in the analysis and interpretation of empirical data. Findings from Jordan's research to date indicate that certain aspects of attitude-behavior are cross-culturally invariant (i.e., the simplex determined largely by the structure of the object-subject relationship):

> . . . certain aspects of attitude-behavior are object specific, situation specific, and/or culture specific, and that attitude change must be approached multi-dimensionally: Knowledge is more related to stereotypic and normative levels and degree of contact, values, and enjoyment factors are more related to actual feelings and action (behavior) levels (Jordan, 1970).

The ABS-MR is the first of a family of scales developed by Jordan using the model presented above. Scales have been developed for attitudes toward other attitude objects such as the blind, deaf, war-disabled in Vietnam, drug users, and racial-ethnic groups (Brodwin, 1973; Erb, 1969; Frachette, 1970; Gottlieb, 1973; Hamersma, 1969; Harrelson, 1970; Harrelson, Jordan and Horn, 1972; Jordan, 1970, 1971; Kaple, 1971; Maierle, 1969; Poulos, 1970; Vurdelja, 1970; Williams, 1970).

Summary of Findings of Previous ABS Scales: Validity of Facet Theory Applied to Attitude Measurement

As previously stated, the contiguity hypothesis (subuniverses closer to each other on a semantic scale will be closer statistically) suggests the basis for postulating the simplex structure. Kaiser (1962) developed a procedure for testing a simplex approximation that has been utilized by the various researchers in Jordan's group. Kaiser's procedure orders the variables and provides a measure of goodness of fit of the scales to the data. It may be

seen as performing two functions: (a) a "sorting" of virtually all possible adjacent pairs of correlation matrix entries to generate the best empirically possible simplex approximation; and (b) an assessment of the descriptive statistics with a range of 0.00 to 1.00. Harrelson (1969) discusses the Kaiser method in detail.

Hamersma (1969) suggested that "six-reversals" should be maximum possible in a 6 x 6 matrix to still consider it as approximating a simplex. By the "six reversal" criteria, a Kaiser value of .60 would appear minimal and preferably a value of .70 for a 6 x 6 matrix to be acceptable as a simplex (Jordan, 1970). Thus far, the results of the ABS scales are quite favorable (Brodwin, 1973). Most of the earlier studies using the Mental Retardation scale reached this level of simplex approximation and the more recent modifications of the ABS scales have yielded simplex approximation scores approaching 1.00 (Brodwin, 1973).

Jordan (1970) reports the results of an early study using the ABS-MR in which three groups were studied: (a) 88 Michigan State University graduate students in a course on medical information; (b) 633 regular education students; and (c) 523 elementary school teachers in Belize. All three groups yielded the simplex approximation pattern: .97 for the graduate students, .94 for the regular education students, and .85 for the Belize teachers. All of the values exceeded Hamersma's minimal criteria of .60.

The simplex relation has also been obtained for other, more recent studies using the ABS-MR (Gottlieb, 1973; Harrelson, 1970; Harrelson, Jordan and Horn, 1972; Jordan, 1970, 1971; Moran, 1969;

and Vurdelja, 1970). Poulus (1970) developed an Attitude-Behavior Scale-Deaf and his data yielded a simplex approximation for all groups, running from .83 to .93. Frechette's (1970) study of attitudes of French- and English-speaking Canadians toward West Indian immigrants yielded simplex approximation patterns ranging from .54 to .91; the best order matrix value ranged from .76 to .93. Williams (1970), using the ABS:BW/WN scale, found hypothesized simplex scores of .73 to .90. According to Brodwin (1973), as the ABS is revised, closer approximations to the perfect simplex result. A more recent development in the Attitude-Behavior Scales has been the "drug scale" developed by Jordan, Kaple and Nicholson (Kaple, 1971). The simplex results from this scale have been the most successful. Kaple's (1971) study used further refinements in the ABS scale: his simplex approximations not only exceeded all of the other ABS results but approached 1.00, a theoretically perfect simplex. Kaple's data resulted in a simplex approximation of .98 and only one of his groups failed to exceed the .60 requirement postulated by Hamersma (1969).

Thus far it can be concluded from Kaple's modification of the Attitude-Behavior Scales that it does order the attitude-behaviors along the six-joint level continuum by a simple order of complexity: the weak-to-strong principle. Kaple recommends that additional experimentation and research is needed to further evaluate the effects of slight differences in semantic structure (Kaple, 1971).

Other forms of testing the validity of the ABS series of scales have also been applied. The content validity of the ABS scale can be assumed since items (situations) are evolved in cooperation with practicing professionals in the field of interest, and the known group method of determining validity has been regularly utilized (Jordan, 1971). Furthermore, facet theory guides the selection of items and thus helps insure that the item universe was sampled (Jordan, 1970). Finally, the construction of the Attitude-Behavior Scales in general has been based on facet theory and therefore selection of items follows a systematic a priori method instead of by the method of intuition or by the use of judges (Jordan, 1970). Every item on every level of a form of the ABS corresponds to a combination of elements of each and every facet. Anastasi (1967) states that "content validity involves essentially the systematic examination of the test content to determine whether it covers a representative sample of the behavior domain to be measured" (p. 100). Anastasi further suggests a thorough and systematic examination of relevant subjective material as well as consultation with experts knowledgeable in the specific area. This has been the rule in construction of the Attitude-Behavior Scales.

Standard reliability procedures have also been applied to the Attitude-Behavior Scales. Reliability coefficients for the ABS-MR and the ABS-BW range between .70 and .95 (Jordan, 1971; Morin, 1969). The method used for reliability has been Hoyt's (1967) method which produces a coefficient similar to the Kueder Richardson 20 measure of consistency. Reliability coefficients

found in studies compare favorably to many tests described by Anastasi (1967) and with the bulk of the other attitude scales described by Shaw and Wright (1967; also see Brodwin, 1973; Gottlieb, 1973).

In summary, validity and reliability findings show that the ABS consistently differentiates within and between respective known groups, that the simplex structure has consistently been obtained, and that the reliability of the scale has proven to be acceptable. Thus far, no research studies have been directed at the question of multiple attitude objects and the joint lateral interaction when joint and lateral dimensions are held constant across the attitude objects. As stated in Chapter I, the purpose of this study was to further examine the construct validity of the facet theory approach to the measurement of attitudes. Facet theory, together with the ordering principles, structural hypothesis, and smallest space analysis, specifies certain outcomes. Thus, a test of the construct validity of the metatheory of facets results when selected (unordered) objects and the two ordered structions (joint and lateral) are measured simultaneously.

CHAPTER III

DESIGN AND METHODOLOGY

This research is an extension of Jordan's adaptation of Guttman's metatheory of facets applied to attitude measurement. Jordan (1968) first used facet theory in his attitude research and later found (1970) that no attitude research studies had utilized a facet design. He subsequently developed a new five-facet, six-level research design applied to the measurement of attitude toward the mentally retarded in seven nations (1971). Since that time, thirty-six doctoral dissertations have been completed and a family of Attitude-Behavior Scales have been developed.

Overview of Methodology

In brief, three Attitude-Behavior Scales were developed for the present study utilizing facet procedures toward physical, mental, and social attitude objects: (a) a mental retardation scale, (b) a race scale, and (c) a blind scale. Essentially, three existent ABS scales were modified such that the "same" life situation questions (lateral struction) were asked at three selected joint structioned levels: stereotypic, moral evaluation, and personal feeling. The research was designed to control for sources of variation due to the joint and lateral dimensions, by holding constant these dimensions (the joint and lateral) and changing only the

object-in-situation relationship. The scales were administered to a homogeneous sample to enable reduction of variance due to differential contact with the attitude objects, social class, age, etc. The order of scale administration was balanced to control for progressive error and response set (Underwood, 1966).

Ordering Principle of Facet Design: Lateral Struction

In constructing the first scale, the ABS-MR, Jordan (1970) postulated the following: ". . . that attitudes involved not only object specificity, but situation-specificity, and object-subject relationships" (p. 48). In the case of the MR scale, the object was the mentally retarded; situations included such areas as experiences with education, personal characteristics, and relationships between the object and the actor (respondent-self) or his referent (others).

It was shown in Chapter II that Guttman (1959) postulated a common semantic meaning for the structioned facets and a progression from weak to strong forms of behavior of the subjects vis-à-vis the attitude object. Table 8 provides the Guttman-Jordan design to determine joint struction (see Appendix A for Glossary of terms). Examination of Table 8 reveals the rationale for joint struction, with weak to strong components of the following form:

Facet A--the referent "other" is weaker than "self" (I) in being less personal.

Facet B--"belief" is weaker than "experience" (overt behavior) in being "passive" rather than "active."

TABLE 8.--Facets Used to Determine Joint Struction[a] of an Attitude Universe.

(A) Referent	(B) Referent Behavior	(C) Actor	(D) Actor's Intergroup Behavior	(E) Domain of Actor's Behavior
a_1 others	b_1 belief	c_1 others	d_1 comparison	e_1 hypothetical
a_2 self-I	b_2 experience (overt behavior)	c_2 self	d_2 interaction	e_2 operational

[a]Joint struction is operationally defined as the ordered sets of the five facets from low to high (subscript 1's are low) across all five facets simultaneously.

Facet C--referring to the behavior of one's "self" (mine/ rather than that of "others" is stronger in that it implies personal involvement.

Facet D--"comparative" behavior is weaker than "interactive" behavior. It does not imply social contact, and a comparison is more passive than interaction.

Facet E--"hypothetical" behavior is weaker than "operational." It does not imply acting out behavior.

According to Jordan (1971), structioned attitude scales "facilitate a sampling of items" and provide a "set of clearly defined profiles" (structuples). Thus far, this procedure has been restricted to the order implied in the five joint facets of Table 8, which are independent of the attitude objects. While an ordering principle is clear for the joint dimension, an additional problem is encountered when attempts are made to order the relationships between objects and situations: Is it possible to establish an ordering principle such that inter-item content, between objects,

and objects-in-situations, can be structured or "ordered" with some explicit a priori semantic meaning as opposed to a posteriori procedures such as factor analysis? (Brodwin, 1973; Jordan, 1971). The rationale utilized in previous Attitude-Behavior Scale construction was to select item content (situations) by the following three principles:

1. Ego involvement: Cognitive-affective. Is the "attitude object-in-situation" dealt with cognitively or affectively?

2. Social distance: Distant-close. Is the "attitude object-in-situation" distant or close to one's self?

3. Relevance: Low-high. Is the "situation" relevant or important to the subject?

In the present study, an attempt to order the lateral dimension is presented. This ordering principle involves ordering the object-in-situation. The objects selected for this study represent a continuum of various disability or disadvantagement groups (Jordan, 1971): the blind, mentally retarded, and Blacks. While attitudes toward these objects have been studied by various members of the research project, to date no studies have compared attitude structures across objects, much less attempted to order the object-in-situation relationship.

The present research, an attempt to study the structure of attitudes across selected attitude objects, necessitated the development of a scale which is comparable and equally meaningful for each of the selected objects. That is, the same situations stated equally for each object, and according to facet theory, a rationale

for ordering the situations. The ordering pricniple for object-in-situation was those situations which occurred on a social distance continuum, from potentially close to the individual to socially distant; this has also been a rationale used for selection of items in previous attitude studies but none have attempted to order the situation along the weak-strong principles postulated by Guttman.

Social distance as an index of attitude was first defined by Park (1902) and pioneered by Bogardes (1928). The social distance continuum ranges from close, warm, and intimate contact to indifference, active dislike, active hostility, and rejection (Good and Hatt, 1952). The Bogardes scale contains seven statements (or scales) beginning with admitting a member of a selected group to close kinship by marriage, to "would exclude that given member from my country." Thus, according to the original Bogardes scale, groups (attitude objects) can be compared by having Ss rank the groups on whether or not they would allow the various groups to relate to them on any of the following levels:

1. to close kinship by marriage
2. to my club as close personal chums
3. to my street as neighbors
4. to employment in my occupation
5. to citizenship in my country
6. as a visitor only to my country
7. would exclude from my country

The assumption from the above statements is that they fall along a continuum from socially close (involving primary group and

daily contact) to socially distant relationships; i.e., if a subject agrees with item 6 or 7 (above), their responses for the remaining items will be negative. This is not the case with items 1 through 5 where a person may in fact check any combination (Good and Hatt, 1952). The Bogardes scale has not been shown to have equal intervals between each of the items and has no true zero point. Evidence in support of this continuum has been obtained by several research studies (Bogardes, 1959; Good and Hatt, 1952).

Guttman (1944, 1947) modified the Bogardes scale to a more general form. Each statement of the Guttman version forms part of a scale and becomes progressively "stronger" or "more difficult." A person has to be more bigoted to endorse or agree with each succeeding statement. The assumption is that a person will endorse items up to a certain point after which he will refuse endorsement (disagree with). His attitude is characterized by the most "radical" statement he endorses.

A modified version of the Bogardes scale formed the ordering principle for this research. The following ten stems formed the original pool of potential items:

1. as a close family member
2. as a close personal friend
3. more cruel to their children
4. trust with their money
5. live next door as neighbors
6. as a member of their church community
7. as fellow workers

8. have the same educational opportunities
9. have the same citizenship rights
10. satisfied with their status in our society

These stems represented close personal primary group relations involving daily interaction (items 1 through 4), more distant secondary group relations (items 5 through 7), and distant societal civil rights-type situations (items 8 through 10). These items were piloted on a group of 20 adult judges who responded to the questionnaire and provided ratings concerning the unidimensionality of the item content. From their discussion, it was concluded that item 3 (more cruel to their children) should be dropped from the potential pool of items. Therefore, a nine-item scale was utilized. This left three items for each of the three social distance classifications: primary group relations, secondary group relations, and societal relations.

Figure 4 provides the complete mapping sentence for the present study. Facets A through E represent joint struction; facet F, the lateral dimensions; and facet G, the attitude object. Facet H deals with response mode. From the facet design shown in Figure 4, nine content items were developed at each of three joint structioned levels, for each of three attitude objects (see Appendix B for the final scale). The response mode involved four alternatives ranging from very negative to very positive. Thus, from a theory of content dictated by the mapping sentence, items for the scale were constructed and written across (joint and lateral structioned) three levels with no regard to attitude object: stereotypic, moral

	(A) Referent		(B) Referent Behavior		(C) Actor
Subject (X) attributes to referent	a_1 others a_2 self	who has	b_1 beliefs b_2 experience	vis-à-vis the actor	c_1 others c_2 self

	(D) Actor's Intergroup Behavior		(E) Domain of Actor's Behavior
that the actor	d_1 compares d_2 interacts (with)	the referent	e_1 hypothetically e_2 operationally

	(F) Life Situations distant-close		(G) Attitude Object		(H) Importance	
in	f_1 social status f_2 society f_3 education f_4 occupation or work f_5 church community f_6 accept as neighbor f_7 trust with money f_8 primary group f_9 kinship	with	g_1 Blacks g_2 Mentally Retarded g_3 Blind	having →	h_1 strongly negative h_2 negative h_3 positive h_4 strongly positive	importance.

Figure 4.--A Mapping Sentence for the Facet Analysis of Attitudes Toward Blacks, Mentally Retarded, and Blind.

evaluation, and personal feeling. The items (situations) comprised a social distance continuum.

Selection of a Homogeneous Sample

The ABS series of studies have shown that important predictors of attitudes include (a) the frequency of contact with the object of interest, (b) whether or not the individual enjoyed that contact, and (c) the perceived voluntariness of the contact. These factors, as well as demographic variables such as age, religion, degree of urbanicity, to name only a few, have been found to contribute to attitude positiveness. Finally, the importance of the object to the respondent has been viewed a potential determinant of attitude. Audi (1972) states that "in order to predict behavior, we should also determine as well as we can, both the subject's beliefs of how he can or might affect the object of his attitude, and the relative strengths of his wants to effect it . . . ." And "we must also determine if he wants to concern himself with . . ." the object (p. 200). For the purpose of the present study, these factors were held constant by selecting a relatively homogeneous sample. Thus sources of variation due to contact with the attitude object, demographic factors, and importance of the attitude object were held constant.

The sample came from an area in Wisconsin where the frequency of contact with Blacks, blind persons, and mentally retarded individuals remains relatively equal. A small private Catholic college with an enrollment of approximately 900 students was the site

selected for sampling. Students at this college have predominantly a rural background (57 percent of the students were reared in rural areas and generally on a farm), are predominantly Catholic, and about 70 percent of the college is female. Contact with Blacks in the community is limited (less than one percent of the student body is Black and none are blind). Few Blacks reside in the community, which has a population of 57,000 in the 1970 census. All of those students enrolled in psychology and sociology courses were administered the ABS.

Scale Administration Procedures

The scale was administered to Ss in group settings of between 10 to no more than 30 persons. Ss received booklets containing the scale (see Appendix B), a number 2 pencil, and an optical scan answer sheet. The instructions for answering the questions were contained on the cover page of the booklet. Ss were verbally asked to provide answers to all questions.

Underwood (1966) argues that experiments may be confounded due to progressive error: the error introduced due to practice effects or "as a result of successive trials." Because all Ss responded to the same attitude objects in the same life situations, it was necessary to control for error due to the order of scale administration. That is, if all Ss were to answer the scales concerning Blacks, then the mentally retarded, then the blind, differences between their responses to these attitude objects may be due solely to fatigue, response set, leaning, etc. Therefore, the order

of scale presentation was balanced in this study. There are three factorial possibilities (six potential orders) and each of these orders was presented to one-sixth of the total sample. Consequently, each of the scales was presented to one-third of the Ss first, one-third of the Ss second, and one-third of the Ss third, in the order of administration. Table 9 presents the six orders of the scale administration.

TABLE 9.--Order of Scale Administration.

Scale Order	Positions in the Order		
	First	Second	Third
1	Black	MR	Blind
2	Black	Blind	MR
3	MR	Black	Blind
4	MR	Blind	Black
5	Blind	Black	MR
6	Blind	MR	Black

Statistical Analysis

Preparation of Data

Item responses were transcribed from optical scan sheets to Holorith cards. The original order of administration was retained to enable analysis of the effects of order on the attitude responses. The standard frequency count program, designated as FCC, was used to compile frequency distributions for each item on the instrument.

This procedure has been found useful as a final precaution to ensure that the data fed into the computer for analysis is accurate. In addition, three subscores for each object at each joint struction level were devised: the primary group relations, secondary group relations, and social relations scores. These scores were calculated by a simple summing of the three items dealing with primary, secondary, and societal relations. Thus, for each respondent, 27 scores were derived: three objects at three levels, for three social distance subscores.

Multivariate Analysis of Variance

To test the effect of order of scale administration, a repeated measure multivariate analysis of variance test was conducted. The multivariate analysis of variance, covariance, and a regression program was developed by Finn (1968) and modified for use on the CDC 6500 computer at Michigan State University by Scheifely and Schmidt (1973). MANOVA yields three types of F ratios: multivariate F ratios, step-down F ratios, and univariate F ratios. The multivariate F is an analysis of whether or not the classification or independent variables are significant. In this case, the dependent variables were Helmert contrasts and, consequently, step-down analysis was considered to be meaningless because these F's are conditioned upon each other. The univariate F was a test of the Helmert contrast and was therefore a post hoc test of significance. If the multivariate F was significant, then the next step was to examine the contrast, to determine which of the contrasts were significant.

Simplex Approximation Test

The method developed by Kaiser (1962) was utilized to test the simplex approximation for those possible simplexes involving more than three variables of scores. This procedure was discussed in detail in Chapter II. Briefly, the approach performs two functions: (a) sorting and rearranging adjacent pairs of correlation coefficients to generate the best empirically possible simplex, and (b) assignment of a descriptive statistic, $\underline{Q}^2$, to the original and rearranged correlation matrices. The $\underline{Q}^2$ index has a range of 0.0 to 1.00 and the higher the value, the more perfect the simplex. Hammersma (1969) has shown that six order reversals are maximum for an approximate simplex in a 6 x 6 matrix. By this criteria, a $\underline{Q}^2$ value of .60 is considered minimal as an approximation of a simplex (Hammersma, 1969). This procedure is available as a library program on the CDC 6500 computer at Michigan State University.

Smallest Space Analysis I

Simple Pearson Product Moment correlation coefficients were calculated between the 27 dependent scores, and smallest space analysis was utilized to examine the structure of the correlation matrix. The smallest space analysis program at the University of Michigan computer center was utilized (Lingoes, 1973).

Factor Analysis

Orthogonal factor analysis with varimax rotation of the 27 dependent scores was conducted. This program is available at

Michigan State University as part of the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner, and Bent, 1970).

Hypotheses

The overall purpose of this study was to test the construct validity of the metatheory of facets as applied to attitude measurement.

Hypothesis 1: Scale Administration

H-1: The order of scale administration will have no effect on attitude.

Rationale: The order of scale presentation was balanced in this study. Since this technique was used to control for progressive error, practice effects (Underwood, 1966), it is expected that differential effects will balance out across the six potential orders.

Instrumentation: Six scale orders were retained and the three social distance scores at each of the three joint levels for each of the three attitude objects comprised the dependent scores.

Analysis: Repeated measures multivariate analysis of variance.

Hypothesis 2: Simplex for Social Distance

H-2: A simplex order will be obtained for the social distance items at each joint structioned attitude level for each attitude object.

Rationale: Since the social distance situations comprise an ordered facet, with a weak-to-strong ordering principle, each item should involve increasing complexity and therefore a simplex structure is expected.

Instrumentation: Correlations between the nine social distance lateral structioned items at each of the joint structioned levels for each of the attitude objects.

Analysis: Kaiser Q^2.

Hypothesis 3: Simplex for Facetized Scales

H-3: A simplex order will be obtained for each facet derived scale.

Rationale: Thus far, research on the ABS family has shown that the expected simplex approximation structure has consistently been obtained and consequently evidence for construct validity has been found. No research studies have investigated the interaction between joint and lateral struction across various attitude objects.

Instrumentation: Correlations between the three joint level scores for each of the attitude objects.

Analysis: Product moment correlation coefficients.

Hypothesis 4: Structure of Facet Derived Scales

H-4: Smallest space analysis will produce the number of "spacial regions" equal to the number of dimensions posited by facet theory.

Rationale: The ordering principles and consequent structural hypothesis in the previous ABS studies applied to joint struction (object-subject relationship) only. In this study, Ss were asked to respond positively or negatively toward objects in the same social situation, across the stereotypic, moral evaluation, and personal feeling joint structioned attitude levels. Facet theory predicts,

therefore, that three dimensions will be obtained: (a) that due to the object; (b) that due to joint structioning; and (c) that due to lateral structioning. Given that the three attitude levels (joint struction) and social distance situations (lateral struction) are ordered facets, it is expected that these two structions will perform modulating or axial roles (see Chapter II). Also, given that the three objects in the research are unordered, it is expected that objects will perform a polarizing role. Therefore, the structure of a cylindrex was postulated for the three dimensions.

Instrumentation: Twenty-seven correlation coefficients--three social distance lateral structioned subscores, at three joint structioned levels, for three attitude objects.

Analysis: Smallest Space Analysis I.

Hypothesis 5: Factor Analysis Compared to Smallest Space Analysis

H-5: Factor analysis will result in a greater number of dimensions than smallest space analysis.

Rationale: Guttman (1966) and Schlesinger and Guttman (1969) have shown that factor analysis has consistently obtained more dimensions than smallest space analysis. Therefore, smallest space analysis has been viewed as a more parsimonious method.

Instrumentation: Twenty-seven correlation coefficients--three social distance lateral structioned subscores at three joint structioned levels for three attitude objects.

Analysis: Factor analysis with varimax rotation.

CHAPTER IV

RESULTS

Description of Sample

The purpose of this research was to further explore the construct validity of the metatheory of facets applied to attitude measurement. The sampling procedures resulted in 117 Ss responding to the attitude behavior scale: 96 were females and 21 were males. One S was Black and was dropped from the following analysis. Seventy-six (65.5 percent) of the respondents indicated Catholicism as their religion, 27 (23.3 percent) indicated Protestantism as their religion, and 13 (11.2 percent) indicated "other religions." The educational level for the sample was: 63.8 percent, freshmen; 23.2 percent, sophomore; 9.5 percent, junior; 1.7 percent, senior; and 1.7 percent, special status.

Table 10 contains the arithmetic means for total joint structioned scores, by attitude object and demographic breakdowns of the sample. It must be recalled that the higher the score, the greater degree of attitude positiveness toward the particular object at the particular level. Examining the means for the total sample reveals a trend which remained throughout the breakdowns, that of increasing mean scores (greater attitude positiveness or favorability) as the degree of joint structioned level strength increases. In all

TABLE 10.--Arithmetic Means for Joint[a] Level Scores[b] by Attitude Object and Demographic Classification Variables.

Variables	N	Blacks			Mentally Retarded			Blind		
		ST	ME	PF	ST	ME	PF	ST	ME	PF
Sex										
Female	95	22.39	27.48	28.79	20.96	26.37	28.45	26.36	30.02	29.27
Male	21	20.76	25.62	26.38	20.38	26.86	27.05	26.14	29.86	27.71
Religion										
Catholic	76	21.72	26.79	28.08	20.67	26.04	28.11	25.95	29.78	29.03
Protestant	27	22.81	27.22	28.63	20.67	27.00	28.26	27.63	30.96	29.74
Education										
Freshman	74	22.35	27.28	28.77	20.49	26.36	28.40	25.95	29.71	29.32
Sophomore	27	22.04	27.74	28.29	21.85	26.33	27.70	27.04	30.11	28.59
Junior	11	20.36	25.45	25.81	21.09	27.36	28.09	26.27	30.55	29.18
Senior	2	22.50	23.00	28.00	19.50	23.50	28.50	28.00	32.00	28.50
Urban-Rural										
Country	38	22.60	28.63	28.08	20.84	26.87	27.50	26.32	29.82	28.92
Country-town	27	21.63	24.48	27.29	20.18	26.67	27.81	26.18	29.00	28.29
Suburb	19	21.95	27.63	28.79	21.05	27.21	28.74	26.05	30.74	29.95
City	28	21.82	27.75	29.25	21.26	26.36	28.96	26.96	30.79	29.71
Total	116	22.09	27.15	28.35	20.85	26.46	28.19	26.32	29.99	29.16

[a]Levels: ST = Stereotypic,
ME = Moral Evaluation,
PF = Personal Feeling.

[b]Range of 9 to 36.

breakdowns, the stereotypic attitude, that attributed to the referent group, has the lowest mean scores.

Scale Scores and Reliability

According to the facets shown in the mapping sentence (see Figure 4), nine individual social distance items were developed for three joint structioned attitude levels for each of the three attitude objects. The nine social distance items were selected to form a continuum which moved from close interpersonal primary group relations through secondary group relations to societal, socially distant situations; and three situations for each of the three social distance classifications were possible. Thus, in addition to individual items for each joint level, there were at least three possible subscores. Tables 11, 12, and 13 contain correlation coefficients between individual social distance items and the primary relations (PR), secondary relations (SC), and societal (SO) subscores, and the total score for each joint structioned level by each attitude object. These correlation coefficients have been seen as useful reliability indicators. Examination of the correlations shows inconsistent and highly variable correlation coefficients dependent upon the joint structioned level and attitude object. For example, Item 9 (a societal item) shows consistently the lowest correlation for each of the joint levels and objects, but the coefficient changes from a low of $r = .08$ ($p > .05$) at the stereotypic level for Blind objects, to $r = .47$ ($p \leq .05$) at the moral evaluation joint structioned level for the "Mentally Retarded" object.

TABLE 11.--Correlation of Social Distance Items to Social Distance Subscore Total and Joint Level Total Scores for the Black Attitude Objects

Social Distance Items	Total Subscore Variables			Level Variable
	PR	SC	SO	Total
Stereotypic Level				
1	.75	.45	-.20	.56
2	.79	.57	-.12	.67
3	.83	.64	-.09	.74
4	.67	.81	-.02	.78
5	.57	.86	-.21	.69
6	.49	.79	-.08	.65
7	-.23	-.20	.69	.04
8	.10	.06	.64	.33
9	-.15	-.07	.53	.09
Moral Evaluation Level				
1	.89	.53	.30	.68
2	.88	.61	.36	.74
3	.85	.72	.48	.80
4	.64	.87	.51	.80
5	.64	.90	.50	.82
6	.57	.86	.53	.76
7	.33	.37	.78	.57
8	.47	.56	.80	.70
9	.13	.41	.58	.41
Personal Feeling Level				
1	.80	.40	.16	.65
2	.81	.57	.27	.61
3	.82	.49	.33	.65
4	.48	.87	.49	.73
5	.45	.83	.47	.70
6	.60	.84	.45	.71
7	.48	.62	.73	.67
8	.39	.61	.68	.62
9	-.03	.12	.70	.28

TABLE 12.--Correlation of Social Distance Items to Social Distance Total and Joint Level Total Scores for the Mentally Retarded Attitude Objects.

Social Distance Items	Total Subscore Variables			Level Variable
	PR	SC	SO	Total
Stereotypic Level				
1	.71	.30	-.08	.45
2	.75	.32	.06	.53
3	.67	.35	.33	.63
4	.47	.82	.27	.71
5	.15	.74	.18	.48
6	.36	.67	.16	.54
7	.18	.24	.64	.47
8	.10	.16	.71	.43
9	-.01	.11	.48	.26
Moral Evaluation Level				
1	.80	.28	.11	.50
2	.83	.30	.27	.60
3	.72	.45	.32	.64
4	.37	.81	.44	.68
5	.39	.73	.39	.64
6	.25	.74	.32	.55
7	.34	.29	.77	.62
8	.21	.50	.79	.67
9	.07	.32	.67	.47
Personal Feeling Level				
1	.79	.48	.10	.57
2	.69	.51	.29	.63
3	.74	.35	.22	.49
4	.48	.84	.24	.67
5	.41	.72	.29	.54
6	.47	.76	.27	.65
7	.28	.36	.71	.56
8	.22	.31	.60	.44
9	.02	.01	.57	.19

TABLE 13.--Correlation of Social Distance Items to Social Distance Subscores Total and Joint Level Total Scores for the Blind Attitude Objects.

Social Distance Items	Total Subscore Variables			Level Variable
	PR	SC	SO	Total
Stereotypic Level				
1	.77	.52	-.03	.61
2	.75	.30	.13	.55
3	.67	.50	.30	.67
4	.44	.87	.24	.71
5	.44	.82	.23	.69
6	.59	.76	.10	.69
7	.16	.16	.66	.38
8	.20	.34	.73	.51
9	-.03	-.08	.41	.08
Moral Evaluation Level				
1	.80	.43	.34	.65
2	.83	.44	.33	.67
3	.75	.49	.31	.65
4	.36	.80	.41	.63
5	.52	.75	.47	.71
6	.46	.74	.22	.57
7	.30	.31	.75	.56
8	.55	.43	.60	.65
9	.02	.19	.58	.32
Personal Feeling Level				
1	.72	.45	.28	.63
2	.76	.50	.21	.63
3	.31	.25	.05	.41
4	.43	.77	.01	.51
5	.48	.76	.39	.67
6	.34	.77	.32	.59
7	.37	.45	.71	.60
8	.41	.52	.61	.62
9	-.15	-.18	.67	.11

Nevertheless, the items were accepted as sufficiently reliable to continue the analysis.

Examination of Hypotheses

Hypothesis 1: Scale Administration

H-1: The order of scale administration will have no effect on attitude.

Table 14 provides mean social distance scores for joint level and attitude object by order of scale administration. Also included in Table 14 are respective row and column means. Table 15 provides the results obtained from the repeated measures MANOVA for order effect, with the repeated measures occurring across object, level, and social distance variables. In Table 15, "design over measures" title refers to the various potential main effects of attitude objects (O), level (L), and social distance (S), and the various interactions along with Helmert Contrasts. The interaction of "design over measures" with "order" is provided in the second set of columns, which is the test of interest for this hypothesis.

Examination of Table 15 indicates no main overall order effects ($F = .89$; d.f. = 5, 102; $p \leq .49$). However, the object and order of administration interaction was highly significant ($F = 3.36$; d.f. = 10, 202; $p \leq .005$). Bearing in mind that the cell frequency for order effect is unequal and therefore this is a nonorthogonal design, findings of an interaction result in a further confounding of the remaining effects; i.e., further analysis of the remaining F ratios must be done in a "guarded" fashion because alpha is unknown. However, the finding of an order of scale administration

TABLE 14.--Cell Means[a] by Order of Scale Administration, Object, Joint Structioned Level, and Social Distance Subscores.

Order	N	Stereotypic				Moral Evaluation				Feeling				Across Level			
		PR	SC	SO	Total	PR	SC	SO	Total	PR	SC	SO	Total	PR	SC	SO	Total
Black																	
1	19	7.21	8.42	7.89	7.84	8.58	9.94	9.11	9.21	9.00	10.47	9.63	9.70	8.26	9.61	8.89	8.92
2	17	6.59	8.06	8.94	7.86	9.00	10.94	10.56	10.17	9.83	10.94	10.00	10.26	8.47	9.98	9.92	9.43
3	16	7.12	7.94	8.88	7.98	8.43	9.56	9.13	9.04	9.56	10.56	9.43	9.85	8.96	9.35	9.29	8.96
4	19	5.69	6.79	8.42	6.97	8.00	8.58	8.79	8.46	10.11	10.42	9.73	10.09	7.93	8.60	8.98	8.51
5	18	5.89	6.94	8.67	7.17	8.17	9.89	8.94	9.00	10.17	11.06	10.00	10.41	8.08	9.30	9.20	8.86
6	19	6.21	7.10	8.63	7.31	8.68	9.63	8.95	9.09	10.53	11.21	10.31	10.68	8.47	9.31	9.30	9.03
Total	108	6.43	7.53	8.56	7.51	8.47	9.74	9.15	9.12	9.87	10.78	9.86	10.17	8.26	9.35	9.19	8.93
Mentally Retarded																	
1	19	6.42	7.26	7.37	7.02	8.37	9.58	8.42	8.79	9.05	10.21	9.32	9.53	7.95	9.02	8.37	8.45
2	17	7.06	7.53	7.41	7.33	8.47	10.18	8.12	8.92	9.76	10.47	9.41	9.88	8.43	9.39	8.31	8.71
3	16	6.88	7.63	6.50	7.00	8.81	9.94	8.81	9.19	9.94	10.56	9.38	9.96	8.54	9.38	8.23	8.72
4	19	7.00	8.00	7.58	7.53	8.63	10.11	9.00	9.25	9.95	10.32	9.53	9.93	8.53	9.48	8.70	8.90
5	18	5.67	6.78	6.67	6.37	6.83	8.89	7.61	7.87	9.78	10.33	9.22	9.78	7.43	8.67	7.83	7.98
6	19	6.15	6.53	7.47	6.68	8.00	10.15	8.89	8.98	9.84	10.68	9.47	10.00	7.96	9.09	8.61	8.55
Total	108	6.50	7.28	7.19	6.99	8.18	9.79	8.48	8.82	9.71	10.43	9.39	9.84	8.13	9.17	8.35	8.55

TABLE 14.--Continued.

Order	N	Stereotypic				Moral Evaluation				Feeling				Across Level			
		PR	SC	SO	Total	PR	SC	SO	Total	PR	SC	SO	Total	PR	SC	SO	Total
Blind																	
1	19	8.42	9.00	7.95	8.46	9.37	10.16	8.68	9.40	9.84	10.79	9.74	10.12	9.21	9.98	8.79	9.33
2	17	9.35	9.47	8.47	9.10	10.53	10.53	9.06	10.04	10.71	11.00	9.65	10.45	10.20	10.33	9.06	9.86
3	16	8.94	9.13	8.25	9.77	9.31	10.13	9.50	9.65	10.13	10.81	9.50	10.15	9.46	10.02	9.08	9.52
4	19	9.05	9.16	8.47	8.89	10.47	10.47	9.74	10.32	10.32	10.84	9.84	10.33	9.95	10.25	9.35	9.85
5	18	8.50	9.33	8.39	8.74	10.61	11.33	10.11	10.68	10.56	11.00	9.83	10.46	9.89	10.55	9.44	9.96
6	19	8.63	9.32	8.47	8.81	10.16	10.90	9.05	10.04	10.32	10.84	9.89	10.35	9.70	10.35	9.14	9.73
Total	108	8.81	9.23	8.33	8.79	10.08	10.64	9.35	10.02	10.31	10.88	9.75	10.31	9.73	10.25	9.14	9.71
Across Objects																	
1	19	7.53	8.22	7.74	7.77	8.77	9.89	8.74	9.13	9.30	10.49	9.56	9.78	8.47	9.53	8.68	8.89
2	17	7.67	8.35	8.27	8.10	9.33	10.55	9.25	9.71	10.10	10.80	9.66	10.19	9.03	9.90	9.00	9.33
3	16	7.65	8.17	7.88	7.90	8.85	9.88	9.15	9.29	9.88	10.64	9.44	9.99	9.06	9.33	8.82	9.06
4	19	7.25	7.98	8.16	7.80	9.03	9.72	9.18	9.31	10.13	10.53	9.70	10.12	8.80	9.41	9.01	9.08
5	18	6.69	7.68	7.91	7.43	10.76	10.04	8.89	9.90	10.17	10.80	9.68	10.22	9.21	9.51	8.83	9.18
6	19	6.96	7.65	8.19	7.60	8.95	10.19	8.96	9.37	10.23	10.91	9.89	10.34	8.71	9.58	9.01	9.10
Total	108	7.25	8.01	8.03	7.76	8.91	10.06	8.99	9.32	9.96	10.70	9.67	10.11	8.71	9.59	8.90	9.06

[a]Scores range from 3 to 9.

TABLE 15.--Multivariate Analysis of Variance for Order Effect by Object, Level and Social Distance.

Design Over Measures[a,b]		Grand Mean			Interaction of D/M with Order		
Main Effect	Post Hoc	F	df	P	F	df	P
SUM		--	--	--	.89	5,102	.49
O		82.21	2,101	.0001	3.36	10,202	.0005
	O_1	4.99	1,102	.03	2.70	5,102	.025
	O_2	166.00	1,102	.0001	3.80	5,102	.003
L		304.18	2,101	.0001	.95	10,202	.49
	L_1	597.89	1,102	.0001	--	--	--
	L_2	30.82	1,102	.0001	--	--	--
S		88.90	2,101	.0001	.68	10,202	.74
	S_1	54.78	1,102	.0001	--	--	--
	S_2	54.99	1,102	.0001	--	--	--
OL		23.95	4,99	.0001	2.44	20,329	.0007
	O_1 vs L_1	5.66	1,102	.02	1.99	5,102	.09
	O_1 vs L_2	6.88	1,102	.01	3.36	5,102	.008
	O_2 vs L_1	37.24	1,102	.0001	.96	5,102	.45
	O_2 vs L_2	16.63	1,102	.0001	3.02	5,102	.01
OS		21.36	4,99	.0001	1.19	20,329	.26
	O_1 vs S_1	42.24	1,102	.0001	--	--	--
	O_1 vs S_2	46.86	1,102	.0001	--	--	--
	O_2 vs S_1	26.15	1,102	.0001	--	--	--
	O_2 vs S_2	5.36	1,102	.02	--	--	--
LV		17.77	4,99	.0001	1.05	20,329	.41
	L_1 vs S_1	9.57	1,102	.003	--	--	--
	L_1 vs S_2	65.08	1,102	.001	--	--	--
	L_2 vs S_1	8.07	1,102	.005	--	--	--
	L_2 vs S_2	.05	1,102	.82	--	--	--
OLV		9.81	8,95	.0001	.98	40,417	.51
	O_1 vs L_1 vs S_1	16.60	1,102	.0001	--	--	--
	O_1 vs L_1 vs S_2	18.21	1,102	.0001	--	--	--
	O_1 vs L_2 vs S_1	.86	1,102	.36	--	--	--
	O_1 vs L_2 vs S_2	6.59	1,102	.01	--	--	--
	O_2 vs L_1 vs S_1	.45	1,102	.50	--	--	--
	O_2 vs L_1 vs S_2	11.07	1,102	.001	--	--	--
	O_2 vs L_2 vs S_1	17.02	1,102	.0001	--	--	--
	O_2 vs L_2 vs S_2	.24	1,102	.63	--	--	--

[a]Where O represents object, L represents attitude level, and S represents the social distance subscore.

[b] $O_1 = O_1 - \frac{O_2 + O_3}{2}$ $\quad L_1 = L_1 - \frac{L_2 + L_3}{2}$ $\quad S_1 = S_1 - \frac{S_2 + S_3}{2}$

$O_2 = O_2 - O_3$ $\quad L_2 = L_2 - L_3$ $\quad S_2 = S_2 - S_3$

effect does allow rejection of the hypothesis of no order effect. Thus, variance can be assumed to have changed, dependent upon the order of scale administration. It is of interest to note that all remaining interactions with scale order were nonsignificant unless they involved the attitude object. Nonetheless, heterogeneity of variance only reduces correlation coefficients and therefore it was deemed desirable to collapse across order for the following analysis; i.e., the absolute value of the coefficient of monotonicity may have been reduced.

Hypothesis 2: Simplex for Social Distance

H-2: A simplex order will be obtained for the social distance items at each joint structioned attitude level for each attitude object.

Tables 16, 17, and 18 present separately for the "Black," "Mentally Retarded," and "Blind" attitude objects the original correlation matrices between social distance items and the reordered matrices by joint structioned attitude levels. While Kaiser's (1962) simplex approximation test does not take into account negative correlations, only a few negative values were encountered in the matrices (the program utilizes the absolute value of the coefficients). Utilizing a Q^2 value of .70 (Hamersma, 1969) as reflecting a satisfactory simplex approximation, all of the original nine correlation matrices exceeded this value. In addition, the reordered matrices reflect the "best" possible rearrangement of the matrices and in each case the best Q^2 ($\underline{BQ}^2$) improved slightly.

TABLE 16.--Simplex Matrices for Lateral Structioned Social Distance by Joint Structioned Attitude Level for Black Attitude Objects.

Joint Structioned	Original Matrices									Reordered Matrices								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
Stereotypic																		
1.	--									--								
2.	44	--				Q^2 = .78				30	--				BQ^2 = .80			
3.	43	45	--							43	40	--						
4.	43	52	62	--						38	63	54	--					
5.	38	43	54	53	--					43	41	62	53	--				
6.	30	46	40	41	63	--				44	46	45	43	52	--			
7.	-07	-31	-16	-10	-24	-07	--			07	17	16	24	10	31	--		
8.	01	17	04	14	-07	06	22	--		01	06	04	07	14	17	22	--	
9.	-31	-06	-04	-07	-08	-02	-00	03	--	31	02	04	08	07	06	00	03	--
Moral Evaluation																		
1.	--									--								
2.	67	--				Q^2 = .76				67	--				BQ^2 = .76			
3.	63	64	--							63	64	--						
4.	52	51	67	--						52	51	67	--					
5.	47	60	62	70	--					47	60	62	70	--				
6.	40	50	61	59	69	--				40	50	61	59	69	--			
7.	24	32	33	25	39	37	--			40	35	49	46	52	49	--		
8.	40	35	49	46	52	49	57	--		24	32	33	25	39	37	57	--	
9.	00	12	22	40	39	30	09	16	--	00	12	22	40	39	30	16	09	--
Personal Feeling																		
1.	--									--								
2.	45	--				Q^2 = .88				45	--				BQ^2 = .90			
3.	45	53	--							45	53	--						
4.	37	41	40	--						38	61	47	--					
5.	28	44	37	59	--					27	36	32	60	--				
6.	38	61	47	58	58	--				35	41	40	60	71	--			
7.	35	41	40	49	50	60	--			28	44	37	58	58	50	--		
8.	27	36	32	41	58	60	71	--		37	41	40	58	41	49	59	--	
9.	-12	-03	08	22	02	-02	01	03	--	12	03	08	02	03	10	07	22	--

TABLE 17.--Simplex Matrices for Lateral Structioned Social Distance by Joint Structioned Attitude Level for Mentally Retarded Attitude Objects.

Joint Structioned	Original Matrices									Reordered Matrices								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
Stereotypic																		
1.	--									--								
2.	37	--			Q^2 = .84					37	--			BQ^2 = .87				
3.	18	23	--							23	32	--						
4.	34	25	43	--						18	23	22	--					
5.	08	14	11	48	--					34	25	29	43	--				
6.	23	32	22	29	22	--				08	14	23	11	48	--			
7.	-01	11	27	22	13	16	--			01	11	16	27	22	13	--		
8.	-03	05	28	20	06	09	18	--		03	05	09	28	20	06	18	--	
9.	-11	-04	03	06	15	04	-07	09	--	11	04	04	03	06	15	08	09	--
Moral Evaluation																		
1.	--									--								
2.	55	--			Q^2 = .90					55	--			BQ^2 = .91				
3.	32	41	--							32	41	--						
4.	23	24	41	--						30	31	32	--					
5.	30	31	32	52	--					23	24	41	52	--				
6.	13	16	30	33	29	--				13	16	30	29	33	--			
7.	17	31	34	20	23	24	--			17	31	34	23	21	24	--		
8.	09	18	24	51	46	21	44	--		09	18	24	46	51	21	44	--	
9.	-03	09	12	28	17	27	22	32	--	03	09	12	17	28	27	22	32	--
Personal Feeling																		
1.	--									--								
2.	44	--			Q^2 = .83					23	--			BQ^2 = .86				
3.	32	22	--							42	31	--						
4.	38	43	31	--						53	31	38	--					
5.	42	25	23	53	-					24	30	33	42	--				
6.	33	47	30	42	24	--				25	22	44	43	47	--			
7.	19	27	20	26	25	32	--			25	20	19	26	32	27	--		
8.	14	27	09	29	35	12	39	--		35	09	14	29	12	27	39	--	
9.	-11	04	11	05	01	07	02	08	--	01	11	11	05	07	04	02	08	--

TABLE 18.--Simplex Matrices for Lateral Structioned Social Distance by Joint Structioned Attitude Level for Blind Attitude Objects.

Joint Structioned	Original Matrices									Reordered Matrices								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
Stereotypic																		
1.	--									--								
2.	43	--			Q^2 = .86					44	--			BQ^2 = .90				
3.	24	22	--							19	41	--						
4.	37	23	35	--						30	48	35	--					
5.	41	19	36	69	--					23	37	69	48	--				
6.	48	30	50	48	35	--				22	24	36	50	35	--			
7.	03	10	22	22	04	13	--			09	05	41	11	32	29	--		
8.	05	09	29	32	41	11	30	--		10	03	04	13	22	22	30	--	
9.	15	03	05	11	01	08	24	08	--	03	15	01	08	11	05	08	24	--
Moral Evaluation																		
1.	--									--								
2.	56	--			Q^2 = .77					56	--			BQ^2 = .76				
3.	33	42	--							24	38	--						
4.	34	22	28	--						33	42	47	--					
5.	45	24	36	54	--					55	37	15	37	--				
6.	24	38	47	28	32	--				45	42	32	36	56	--			
7.	20	33	19	27	29	17	--			34	22	28	28	35	54	--		
8.	55	37	37	35	56	15	32	--		20	33	17	19	32	29	27	--	
9.	00	04	09	19	13	11	05	02	--	00	04	11	09	02	13	19	05	--
Personal Feeling																		
1.	--									--								
2.	47	--			Q^2 = .72					14	--			BQ^2 = .82				
3.	23	27	--							15	38	--						
4.	36	37	36	--						13	40	52	--					
5.	45	46	18	45	--					18	42	64	43	--				
6.	25	35	14	29	42	--				23	25	36	38	45	--			
7.	38	31	13	24	43	40	--			27	35	42	31	46	47	--		
8.	36	42	15	26	64	38	52	--		36	29	26	24	45	36	37	--	
9.	04	16	18	31	08	01	10	00	--	18	01	01	10	08	04	16	31	--

Therefore, the data in Tables 16, 17, and 18 support the hypothesis: the lateral structioned social distance items do form a simplex for each joint structioned level and for each object; i.e., there is increasing complexity and a weak-strong principle involved in the social distance facet.

Hypothesis 3: Simplex for Facetized Scales

H-3: A simplex order will be obtained for each facet derived scale.

Table 19 provides the correlation matrix for the social distance subscores for each level and object. The diagonal elements in the table have been left open to facilitate inspection of the simplex. There are three subscores for each joint structioned level, for each object. Therefore, there are nine possible simplexes of three correlations each. Seven simplexes were visually obtained from the nine possible: the stereotypic subscores for Blacks and the personal feeling subscores for the Mental Retardation objects, reversed in the order of correlation (variables 1, 2, and 3; and 16, 17, and 18 in Table 19). While nine out of nine possible simplexes were not obtained, seven were, and thus the data largely support the hypothesis of a simplex structure for the facet derived scales.

Hypothesis 4: Structure of Facet Derived Scales

H-4: Smallest space analysis will produce the number of "spacial regions" equal to the number of dimensions posited by facet theory.

Smallest space analysis of the correlations in Table 19 resulted in an adequate portrayal of the structure of the

TABLE 19.--Correlations[a] for Social Distance Subscores by Joint Structioned Level and Attitude Objects.

Variable[b]		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	BKSTPR	--																										
2	BKSTSE	71	--																									
3	BKSTSO	-17	-12	--																								
4	BKMEPR	39	45	-05	--																							
5	BKMESE	39	47	-04	70	--																						
6	BKMESO	28	29	05	41	59	--																					
7	BKPFPR	06	07	-00	26	08	09	--																				
8	BKPFSE	07	16	16	14	10	-03	60	--																			
9	BKPFSO	-04	-00	14	-06	01	-05	18	37	--																		
10	MRSTPR	29	22	09	20	14	23	05	-04	14	--																	
11	MRSTSE	22	36	07	26	27	14	06	-01	-03	46	--																
12	MFSTSO	12	13	16	-00	-02	09	-05	03	13	15	28	--															
13	MRMEPR	23	27	05	40	27	25	21	20	-03	52	37	22	--														
14	MRMESE	11	15	-02	26	39	30	04	02	-08	16	28	12	44	--													
15	MRMESO	-05	-06	14	19	14	31	01	-10	-13	01	-07	15	29	50	--												
16	MRPFPR	-06	-06	-00	-11	-12	-21	42	30	40	10	12	07	15	-03	-16	--											
17	MRPFSE	15	12	-02	-14	-02	-06	30	45	31	00	02	02	14	02	-18	44	--										
18	MRPFSO	-02	01	11	-11	-14	-05	04	13	57	08	-01	26	00	-04	03	50	25	--									
19	BLSTPR	-05	03	08	08	08	-06	-01	-01	02	16	14	-14	10	12	-02	-05	02	-01	--								
20	BDSTSE	10	20	08	19	16	04	-10	03	02	16	30	12	05	10	-02	-19	00	09	60	--							
21	BDSTSO	-09	-09	12	-09	-08	-04	12	10	02	-03	-02	22	-01	04	23	-02	09	04	18	23	--						
22	BDSEPR	-06	07	19	28	31	25	07	-06	00	14	19	10	16	05	03	-01	-13	-02	30	31	-05	--					
23	BDMESE	07	13	18	21	31	15	06	12	14	22	32	19	19	22	10	05	05	11	27	42	07	59	--				
24	BDMESO	-14	-06	23	02	04	24	-01	-06	11	13	18	11	-01	-01	22	-09	-08	10	08	17	09	43	46	--			
25	BDPFPR	-23	-07	04	-14	-08	-14	38	31	23	-11	00	-03	-03	03	-09	34	25	15	16	11	16	09	12	14	--		
26	BDPFSE	00	06	02	-06	02	-07	40	53	32	02	07	-05	03	04	-14	30	53	11	19	21	18	-01	15	07	53	--	
27	BDPRSO	-02	-04	13	-04	01	01	01	20	78	06	-03	19	00	-03	-00	36	21	65	-02	02	11	01	12	20	09	26	--

[a]Decimals have been dropped.

[b]In each variable the six letters represent, in pairs, respectively: (a) object, (b) joint level, and (c) social distance subscore relationships.

interrelationships in a three-dimensional space with a coefficient of alienation equal to .1599, which is marginally sufficient to the generally accepted coefficient. Table 20 provides coordinates* for the three-dimensional space plotted in Figure 5. Figures 6 through 8 provide the same correlational structures plotted separately by joint levels; and Figures 9 through 11 provide the same structure plotted separately by object. (Numbers within the symbols in these figures correspond to the respective social distance subscores, where 1 = primary group relations, 2 = secondary group relations, and 3 = societal relations). The space in the three dimensions partitions into regions: that due to object, and that due to joint level. The total structure of the relations approximates a cylindrex, with joint structioning playing an axial role, objects playing a polarizing role, and social distance playing a modulating role. Figure 12 provides an approximation of the cylindrex obtained in the smallest space analysis, although wide disparities from the approximated cylindrex depend upon the joint structioned attitude level.

To clarify the structure, Figures 13, 14, and 15 portray each section (slice) of the cylindrex by the joint struction axial facet. The space in each of Figures 12, 13, and 14 has been partitioned with solid lines for regions due to objects, and open lines for regions due to the social distance facets. In each level

---

*Coordinates in small space analysis do not imply "meaning" as in factor analysis, but are only used to locate the variables in space in relationship to each other.

TABLE 20.--Guttman-Lingoes' Smallest Space Coordinates for a Three-Dimensional Space.[a]

	Variable[b]	Centrality Index	Dimension[a]		
			Width	Depth	Height
1	BKSTPR	113.8	-61.9	93.6	6.3
2	BKSTSE	97.7	-57.1	75.6	-16.1
3	BKSTSO	107.2	26.9	-100.0	27.7
4	BKMEPR	97.1	-86.4	36.3	-17.4
5	BKMESE	93.6	-87.1	22.5	-18.4
6	BKMESO	104.2	-100.0	-9.4	15.5
7	BKPFPR	90.2	51.6	70.6	-28.9
8	BKPFSE	87.2	70.3	51.9	-18.6
9	BKPFSO	96.9	94.3	-0.8	28.5
10	MRSTPR	72.8	-35.3	44.2	41.8
11	MRSTSE	65.1	-47.2	26.2	-35.1
12	MRSTSO	89.9	2.5	-31.6	82.2
13	MRMEPR	67.8	-43.8	33.6	34.6
14	MRMESE	90.4	-75.1	-3.7	43.1
15	MRMESO	118.9	-67.5	-70.7	63.4
16	MRPFPR	112.1	100.0	43.4	31.8
17	MRPFSE	105.3	88.3	60.7	2.1
18	MRPFSO	104.3	83.6	-10.0	62.6
19	BLDSTPR	103.9	-0.8	-34.3	-100.0
20	BLDSTSE	84.1	-20.3	-28.3	-78.8
21	BLDSTSO	111.3	62.5	-83.2	-44.1
22	BLDMEPR	89.4	-53.0	-53.7	-48.2
23	BLDMESE	48.4	-22.9	-34.2	-25.3
24	BLDMESO	97.3	-17.1	-95.0	-10.9
25	BLDPFPR	108.8	96.1	-3.0	-55.5
26	BLDPFSE	91.2	79.9	22.7	-44.2
27	BLDPFSO	97.4	82.7	-23.4	47.7

[a]Guttman-Lingoes' coefficient of alienation = 0.15990.
[b]Where BK = Black, MR = Mentally Retarded, BL = Blind, ST = Stereotypic, ME = Moral Evaluation, PF = Personal Feeling, PR = Primary, SE = Secondary, SO = Societal.

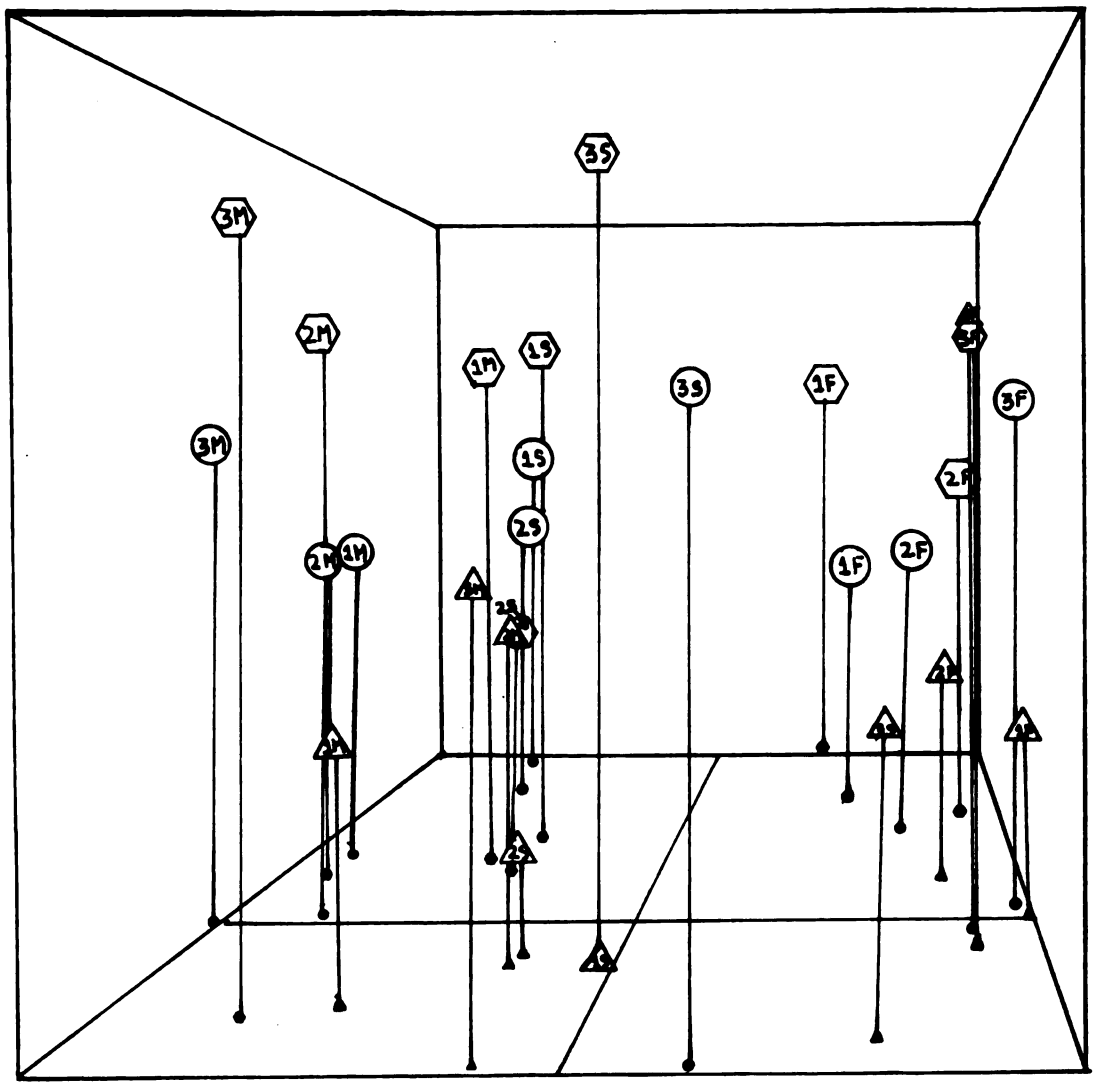

Figure 5.--A Three-Dimensional Representation of Three Joint Structioned Levels[a] and Three Social Distance[b] Subscores for Three Attitude Objects.[c]

[a]Where M = moral evaluation, S = stereotypic, F = personal feeling.

[b]Where 1 = primary group, 2 = secondary group, 3 = societal.

[c]Where O = Blacks, ○ = Mentally Retarded, Δ = Blind.

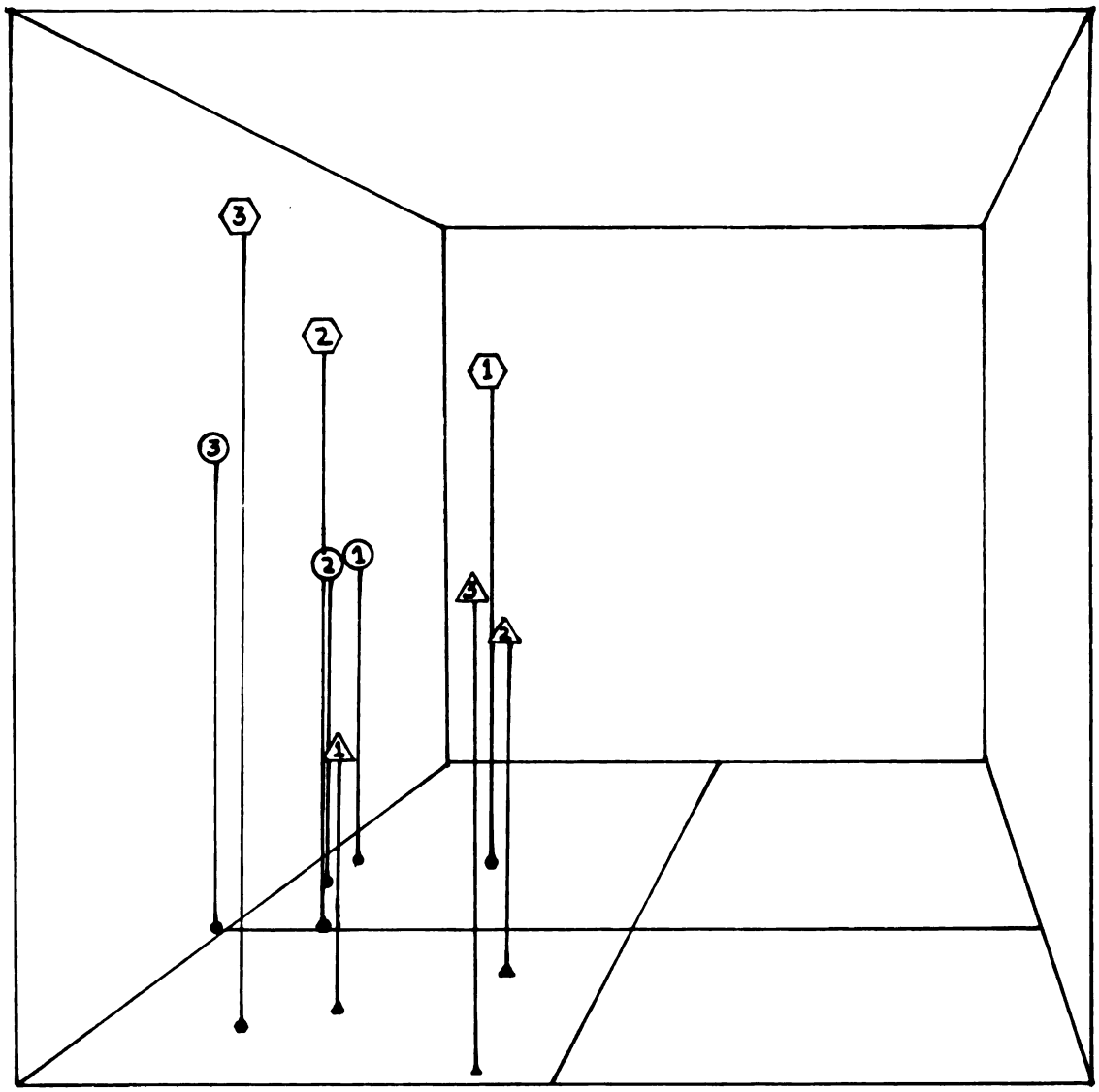

Figure 6.--Three-Dimensional Representation of Moral Evaluation Structioned Level and Social Distance[a] Scores for Three Attitude Objects.[b]

[a]Where 1 = primary group, 2 = secondary group, and 3 = societal.

[b]Where 0 = Blacks, ⬡ = Mentally Retarded, Δ = Blind.

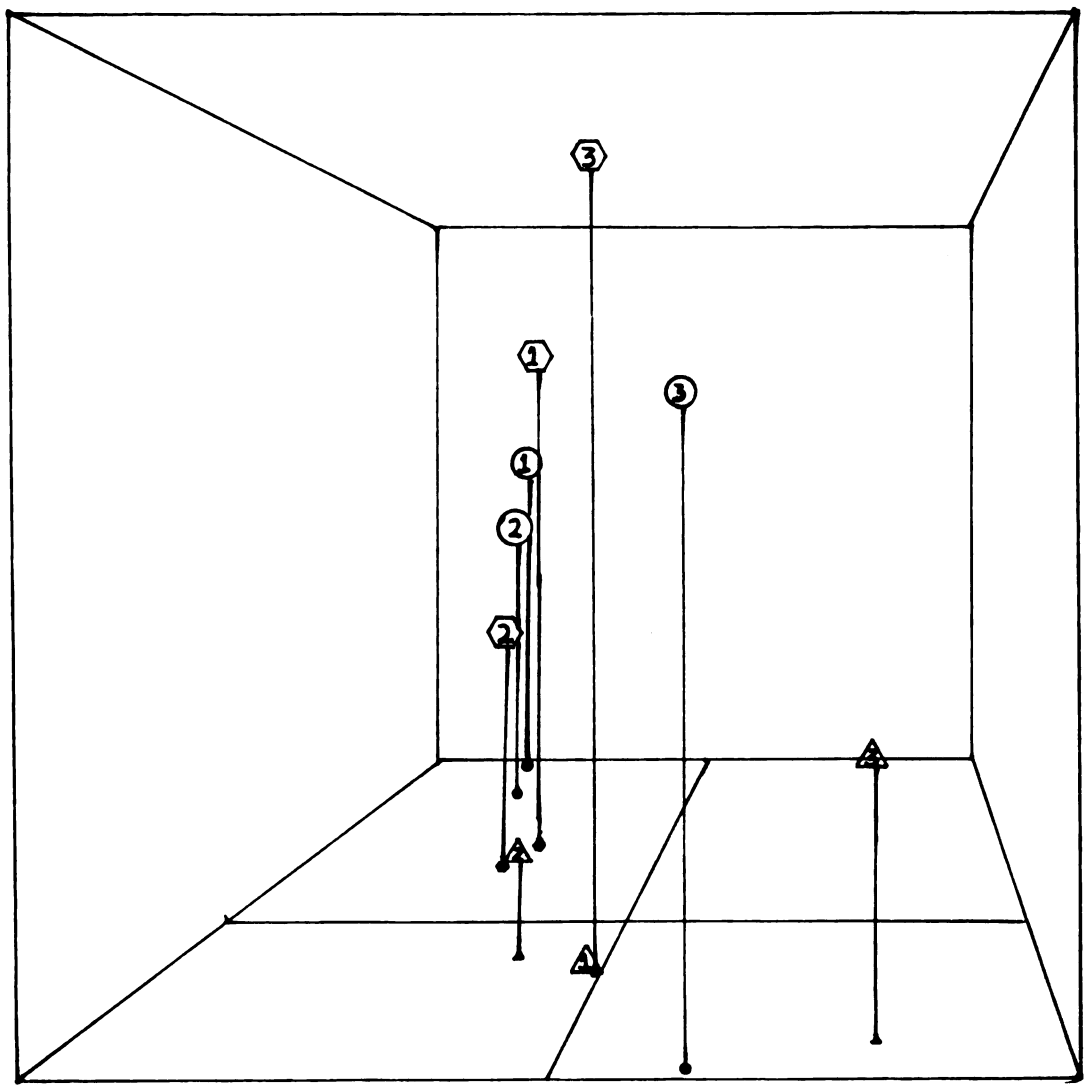

Figure 7.--Three-Dimensional Representation of Stereotypic Structioned Level and Social Distance[a] Scores for Three Attitude Objects.[b]

[a]Where 1 = primary group, 2 = secondary group, 3 = societal.

[b]Where 0 = Blacks, ⬡ = Mentally Retarded, Δ = Blind.

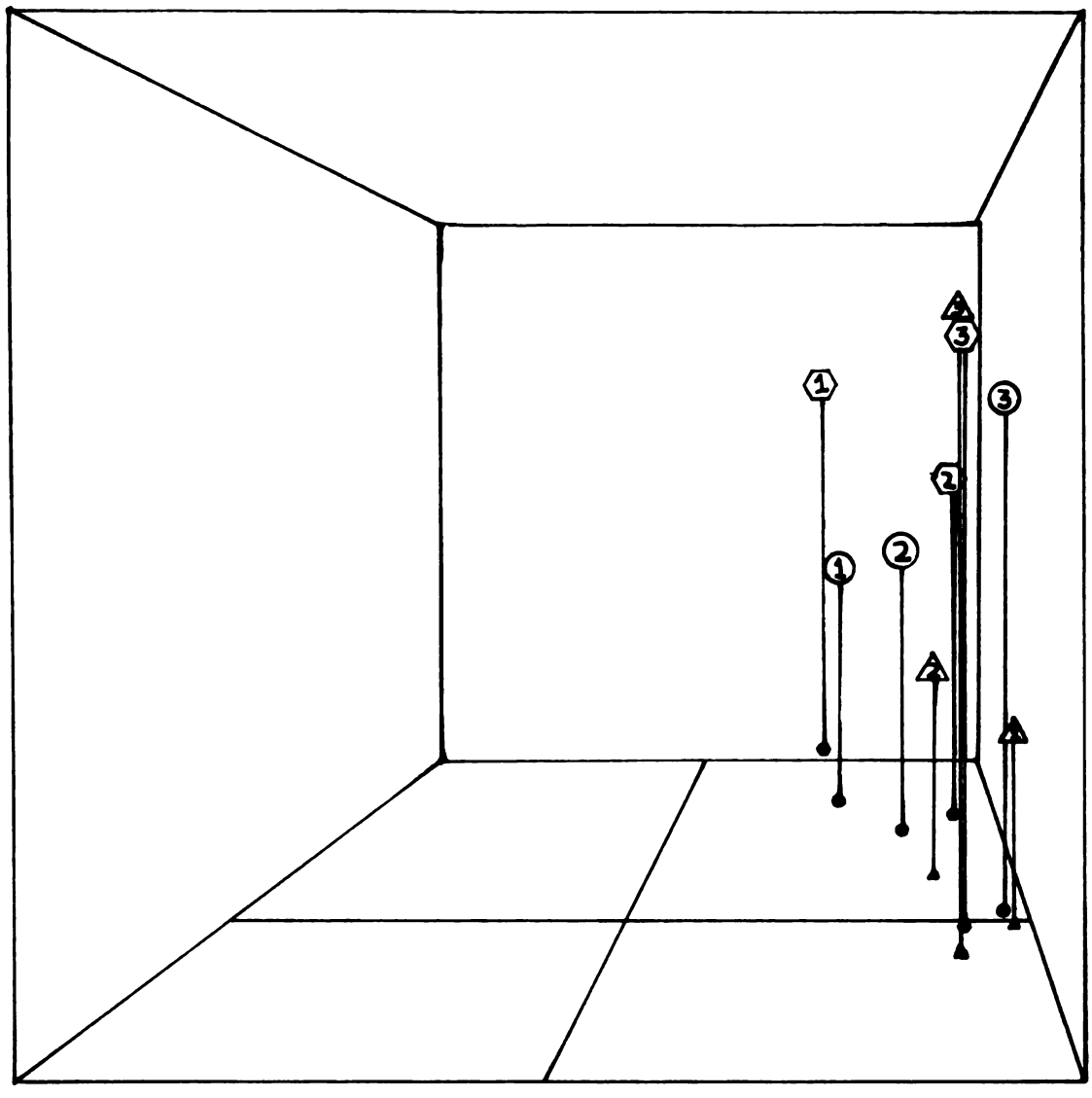

Figure 8.--Three-Dimensional Representation of Personal Feeling Structioned Level and Social Distance Scores[a] for Three Attitude Objects.[b]

[a]Where 1 = primary group, 2 = secondary group, 3 = societal group.

[b]Where 0 = Blacks, ⬡ = Mentally Retarded, Δ = Blind.

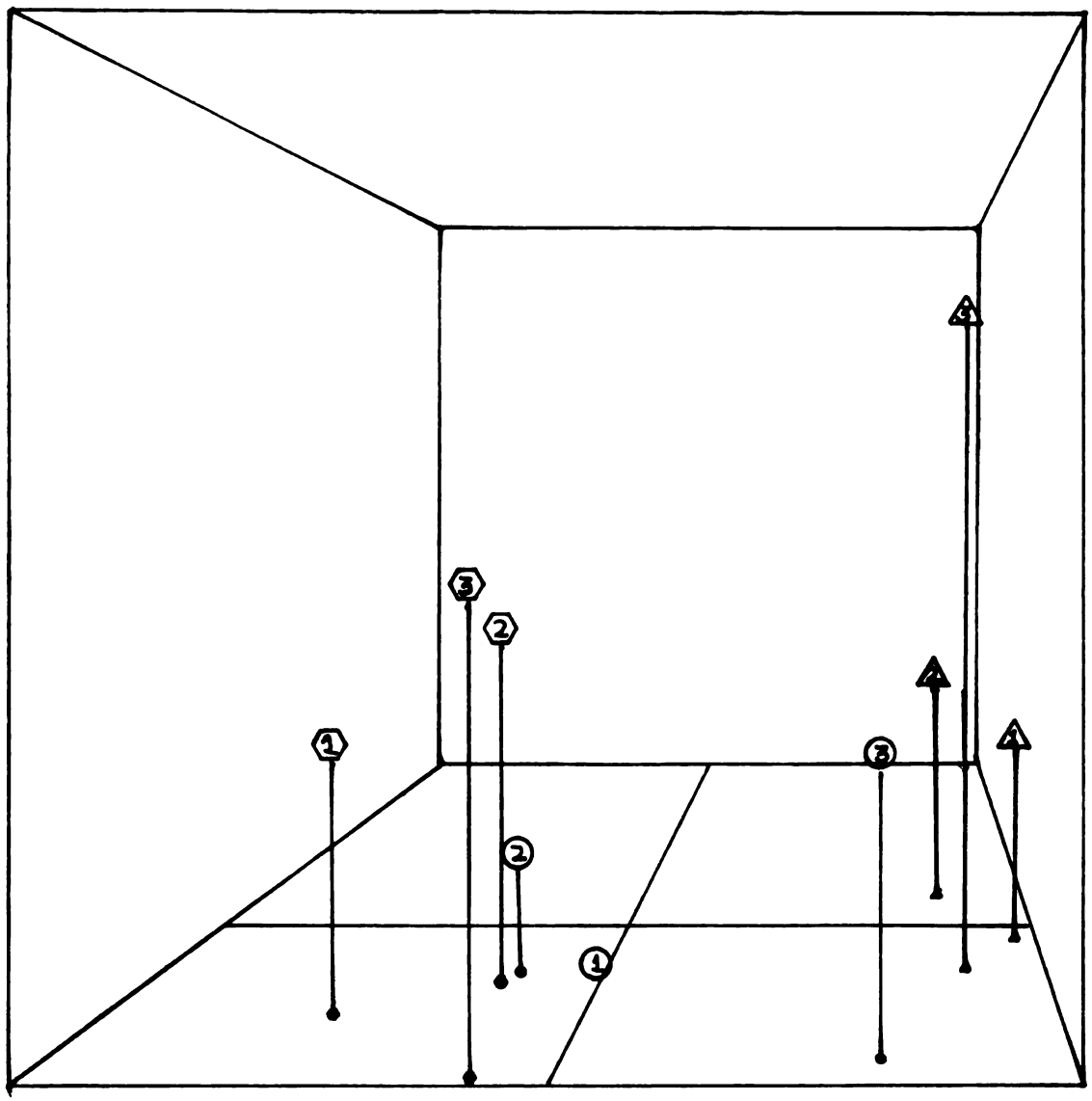

Figure 9.--A Three-Dimensional Representation of Joint Structioned Levels[a] and Social Distance Subscores[b] for "Blind" Attitude Objects.

[a]Where 0 = stereotypic, ⬡ = moral evaluation, Δ = personal feeling.

[b]Where 1 = primary group, 2 = secondary group, 3 = societal group.

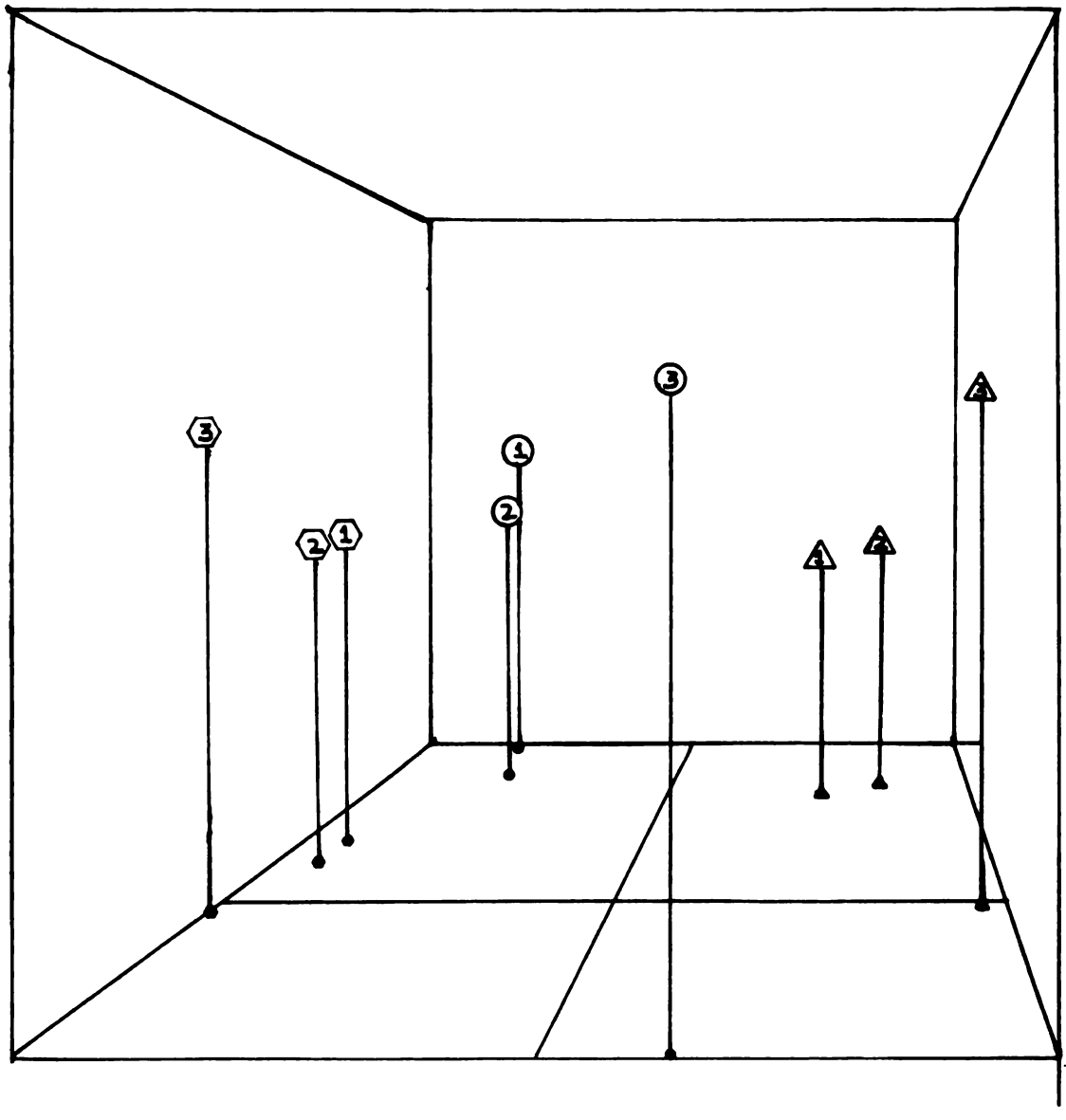

Figure 10.--A Three-Dimensional Representation of Joint Structioned Levels[a] and Social Distance Subscores[b] for "Black" Attitude Objects.

[a]Where 0 = stereotypic, ⬡ = moral evaluation, Δ = personal feeling.

[b]Where 1 = primary group, 2 = secondary group, 3 = societal group.

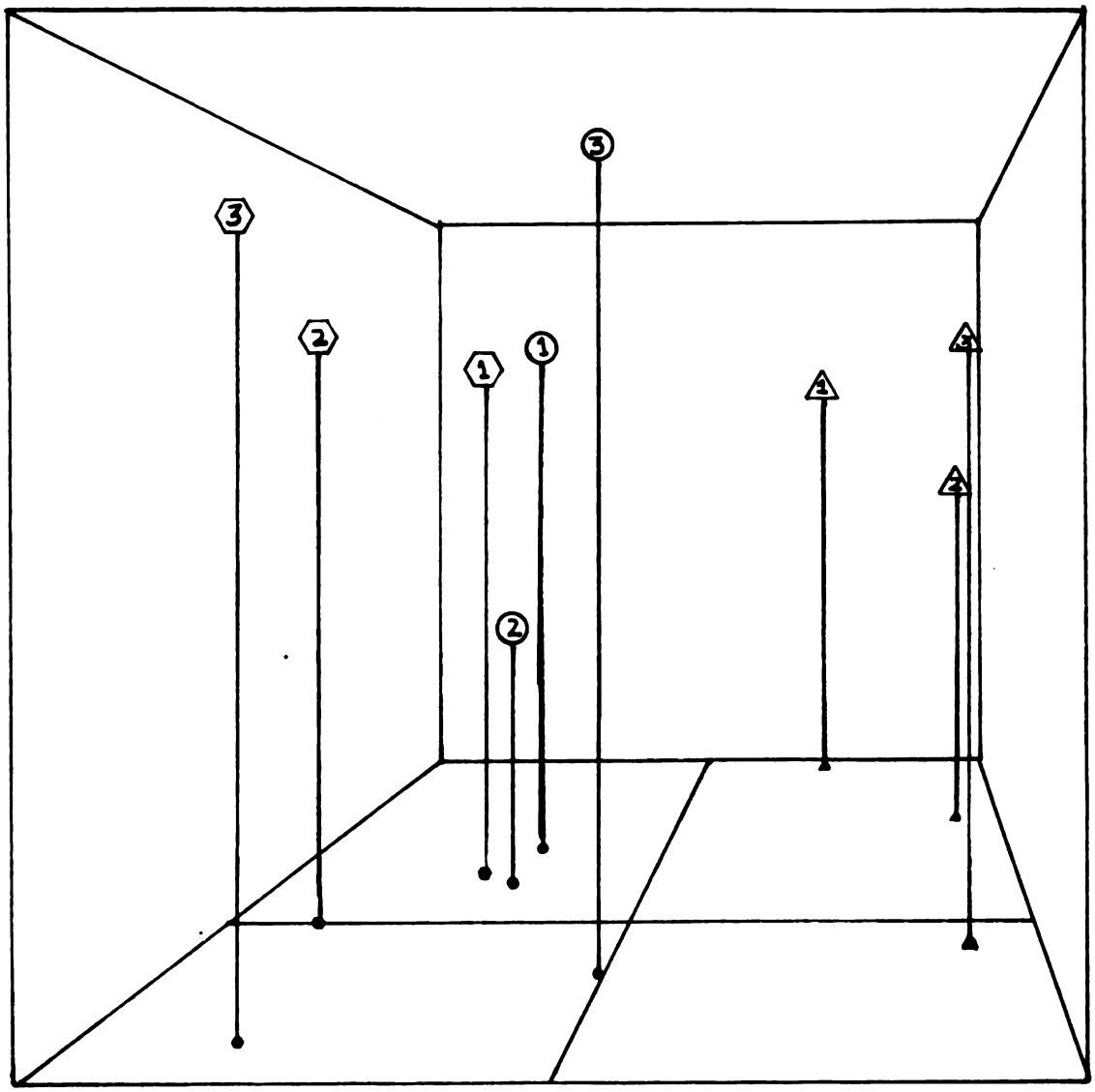

Figure 11.--A Three-Dimensional Representation of Joint Structioned Levels[a] and Social Distance[b] Subscores for "Mentally Retarded" Attitude Objects.

[a]Where O = stereotypic, ⬡ = moral evaluation, Δ = personal feeling.

[b]Where 1 = primary group, 2 = secondary group, 3 = societal group.

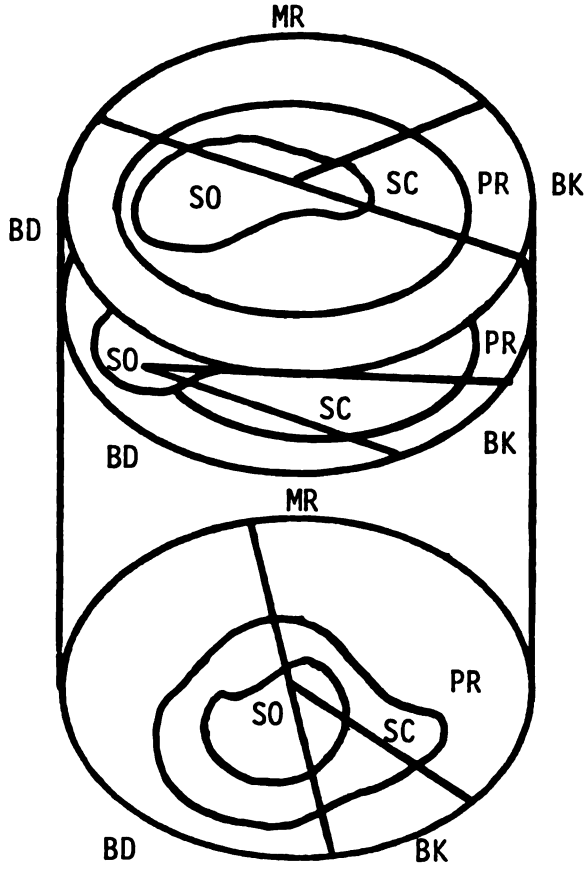

Figure 12.--Approximation of Obtained Cylindrex.

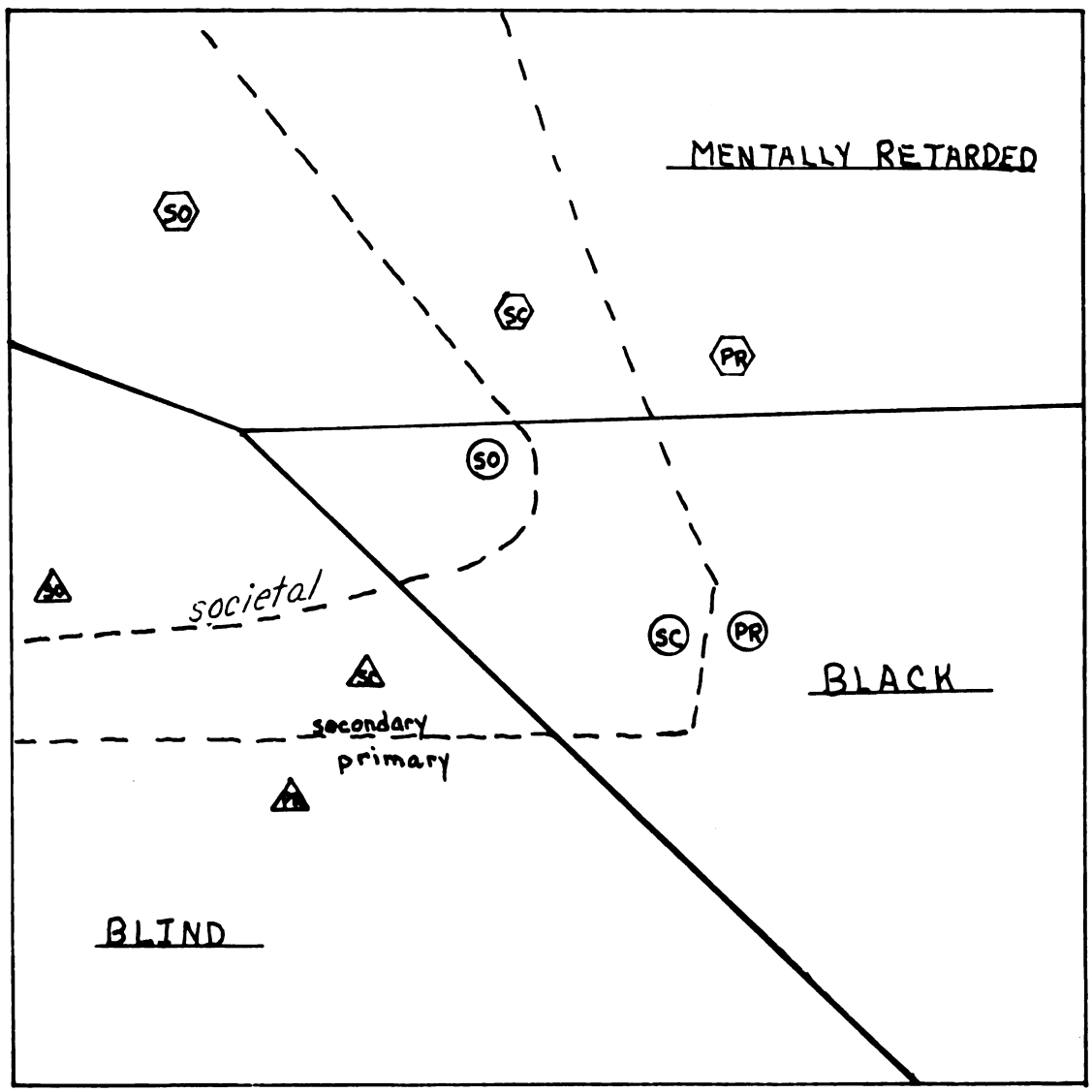

Figure 13.--A Two-Dimensional Plot for Moral Evaluation Axial Facet with Social Distance[a] and Attitude Object.[b]

[a]Where PR = primary, SE = secondary, SO = societal.

[b]Where O = Black, ⬡ = Mentally Rearded, Δ = Blind.

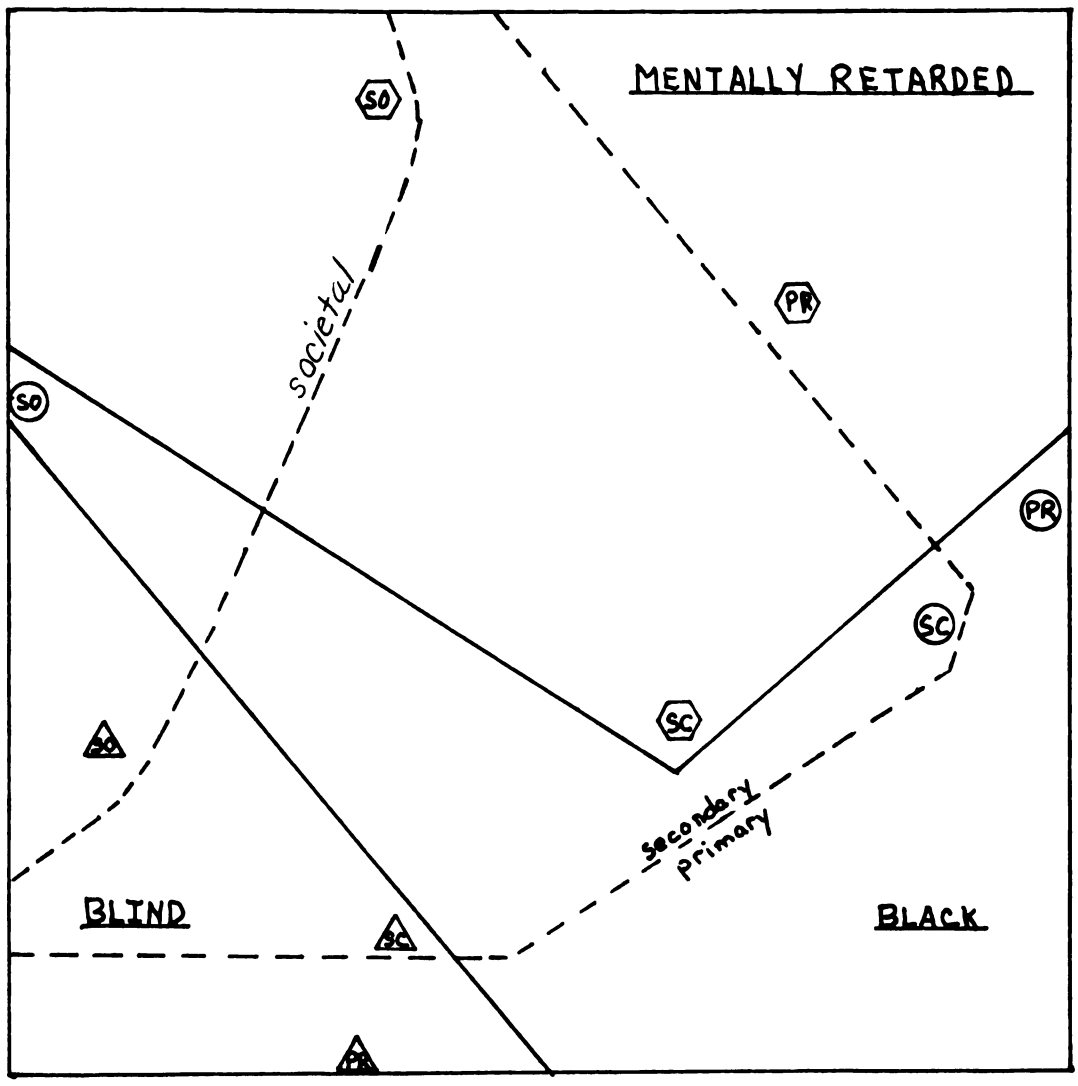

Figure 14.--A Two-Dimensional Plot for Stereotypic Axial Facet with Social Distance,[a] and Attitude Object.[b]

[a]Where PR = primary, SE = secondary, SO = societal.

[b]Where O = Black, ⬡ = Mentally Retarded, Δ = Blind.

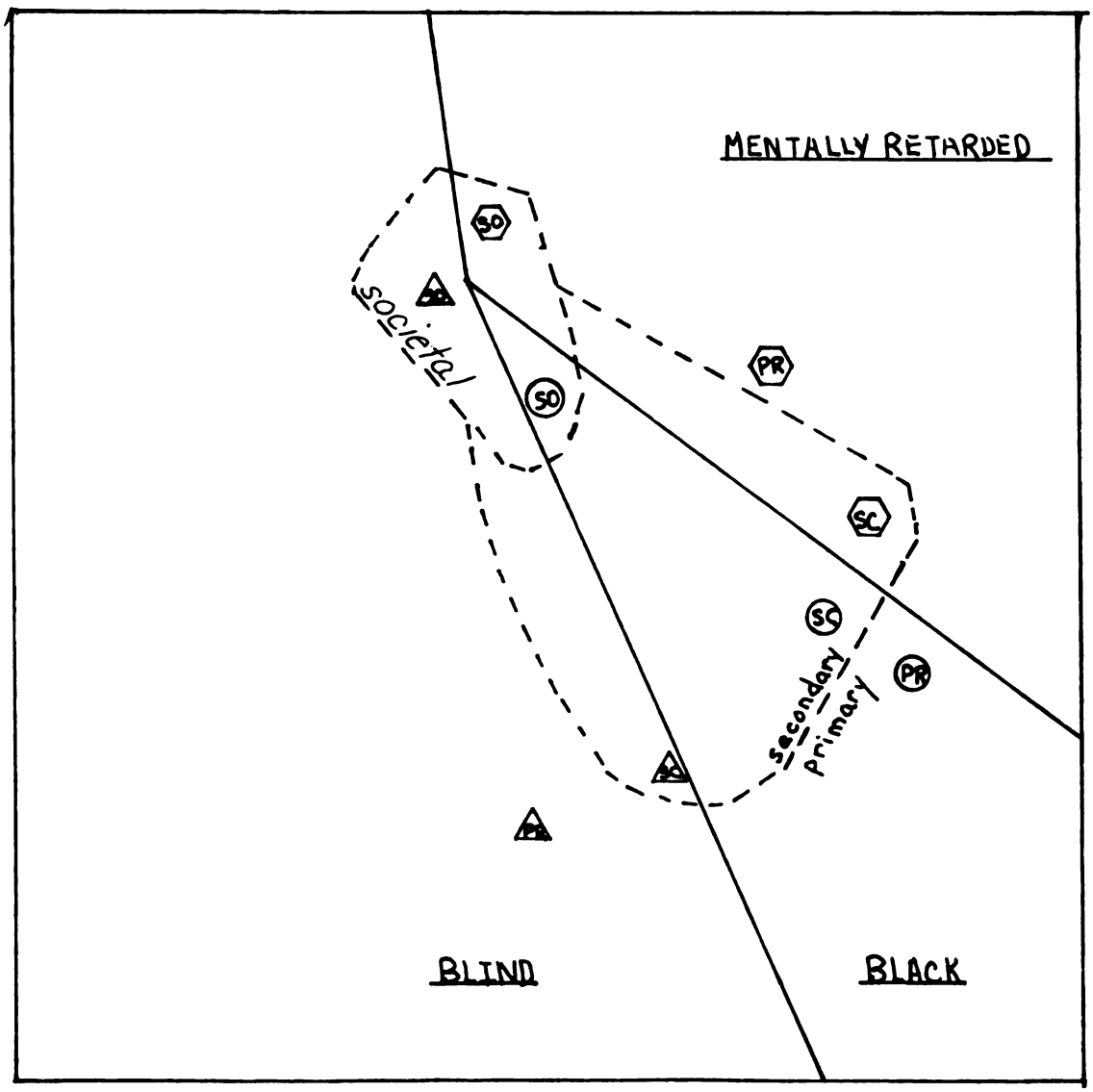

Figure 15.--A Two-Dimensional Plot for Personal Feeling Axial Facet with Social Distance,[a] and Attitude Object.[b]

[a]Where PR = primary, SE = secondary, SO = societal.

[b]Where O = Black, ⬡ = Mentally Retarded, Δ = Blind.

of the cylindrex, the objects converge on the societal relations subscores (i.e., attitudes for the societal relations elements are more homogeneous) and are more divergent (less homogeneous and more distant) for the primary group relations elements of the social distance facets; this is characteristic of modulating facets. The order of objects remained the same for each joint level of the axial facet. Therefore, support for the hypothesis of a three-dimensional space due to the facets in the design was obtained.

Hypothesis 5: Factor Analysis Compared to Smallest Space Analysis

H-5: Factor analysis will result in a greater number of dimensions than smallest space analysis.

Smallest Space Analysis I is a self-contained program which allows default options to determine the number of adequate dimensions needed to portray the structure of the coefficients. In order to compare the procedures it was deemed desirable to utilize the default options for the factor analysis program. Table 21 provides the seven factors obtained with the orthogonal factor analysis using the varimax rotation method. Again, the correlation matrix in Table 19 was the data base. Entries in the table are factor loadings where only loadings $\leq .40$ were entered. Factor 1 is a general feeling dimension with loadings across all objects; Factor 2 is a stereotypic and moral evaluation factor for "Black" attitude objects; Factor 3 is a stereotypic factor for "Blind" objects; Factor 4 is a social relations dimension across all objects; Factor 5 is a "Mental Retardation" object dimension; Factor 6, a "Blind" object moral

TABLE 21.--Rotated Factor Matrix (Varimax) of 27 Depending Scores (Loadings .40).

Variable	Factors[a]							
	1	2	3	4	5	6	7	h^2
BKSTPR		71						63
BKSTSC		76						71
BKSTSO				40				40
BKMEPR		68						63
BKMESC		76						79
BKMESO		51					40	60
BKPFPR	74							65
BKPFSC	76							69
BKPFSO	62			48				69
MRSTPR					65			52
MRSTSC					57			55
MRSTSO				52				44
MRMEPR					65			68
MRMESC							62	61
MRMESO							81	74
MRPFPR	83							79
MRPFSC	79							73
MRPFSO	49			58				64
BDSTPR			71					63
BDSTSC			79					80
BDSTSO								44
BDMEPR						76		76
BDMESC						55		68
BDMESO						58		56
BDPFPR	76							70
BDPFSC	76							76
BDPFSO	52			62				75
Percent of Variance	52.7	16.2	9.1	7.1	5.4	5.1	4.2	

[a]Factors were named:

1 = "General Feeling"
2 = Stereotypic and Moral Evaluation for "Blacks"
3 = Stereotypic for "Blind"
4 = Social Relationships
5 = "Mental Retardation"
6 = Moral Evaluation for "Blind"
7 = General Moral Evaluation

evaluation dimension; and Factor 7 appears to be a general moral evaluation dimension. Only the social relation subscore for the "Blind" objects failed to load on any of the seven factors.

Typically, an eigenvalue of 1.00 or greater is used to determine the number of desirable factors. Four factors would have resulted in meeting this criteria. In either case, the factor analysis resulted in a greater number of dimensions to explain the structure of the correlation than smallest space analysis and consequently the hypothesis was supported.

CHAPTER V

DISCUSSION

The purpose of this research was to further explore the construct validity of the metatheory of facets applied to attitude measurement. Facet theory, as a research tool, specifies outcomes in the form of structural relations.

Overview of Purpose and Methodology

Applied to attitude measurement (Chapter II), it has been shown that one consistent finding is that of a simplex structure, i.e., the highest correlations occur along the main diagonal and decrease the further away from the diagonal the correlations occur. The consistent finding of the simplex structure by Jordan's research group on the facetized ABS series of attitude scales has lent support for the construct validity of facet theory. Given this ordered (a simplex implies an ordering of the variables) joint structioned dimension, it has been shown that the ABS consistently differentiated between known groups and therefore further evidence for the validity of the method has been obtained. Furthermore, the reliability of the scales has proven acceptable.

None of the research studies, however, have investigated an ordering principle for the lateral structioned, social distance situations. According to the principles of proximity and structural

order, various structural outcomes are predicted by facet theory dependent upon a mixture of ordered and unordered facets. As shown in Chapter II, these structures include simplexes, circumplexes, radexes, and cylindrexes, to name only a few of the possible structural outcomes. Furthermore, no research studies have investigated the interaction of joint and lateral structioning across attitude objects. Thus, a test of the construct validity of the metatheory of facets occurs when selected (and unordered) attitude objects and the two ordered structions (joint and lateral) are measured simultaneously.

The metatheory of facets together with the ordering principles, structural hypothesis and smallest space analysis, specify certain structural outcomes, which is the true sense of a theory as defined by Guttman (Chapter I). Thus, the purpose of this study was to examine the construct validity of the metatheory of facets applied to attitude behavior: (a) can the relationship be represented in a multi-dimensional model, (b) can the facets discriminate between attitude objects, and (c) what is the joint-lateral interaction when the joint and lateral structioned facets are held constant across selected attitude objects.

In brief, three attitude-behavior scales utilizing facet theory procedures were developed: (a) a Mental Retardation Scale, (b) a Race Scale, and (c) a Blind Scale. Essentially, existent ABS were modified such that the "same" ordered life situation questions on a social distance continuum (lateral struction) were asked at three selected joint structioned levels: stereotypic, moral

evaluation, and personal feeling. The research was designed to control for sources of variation due to the joint and lateral dimensions, by holding constant these dimensions, and changing only the subject/object-in-situation relationship. The scales were administered to a homogeneous sample to enable reduction of variance due to differential contact with the attitude object, social class, age, etc. The order of scale administration was balanced to control for progressive error and response set (Underwood, 1966).

Order Effect

The hypothesis of no scale order effect was rejected. Variance did change dependent upon the attitude object and the order of scale administration. More specifically, it appears that a complex interaction of scale order, objects, and joint structioned attitude level was obtained. The purpose of counterbalancing the order of scale administration was to allow for collapsing of the scale order. Thus, error due to fatigue, practice effects, etc., could be equalized across the possible orders. The finding of a significant interaction suggests several possible answers and therefore is confounded. Ss responded differentially dependent upon which object, which joint structioned attitude level, and which order of scale administration they were taking. Further research is necessary to ferret out the effects of this interaction. For example, it appears that the interaction of object, joint structioned level, and order of scale administration reveals that subjects were least positive toward the mentally retarded when the social distance situation

involved primary group relations at the stereotypic joint structioned level, and when their responses toward the mentally retarded were preceded by responses toward the blind. It can be speculated that attitudes may be influenced by subjects' responses to other objects; that is, once Ss have responded at a certain magnitude (as, for example, in the psychophysical technique of magnitude estimation) toward one attitude object, they may tend to utilize that object as their standard for remaining attitude objects.

The remaining analysis was conducted on the scale, ignoring the order of scale adminstration (which was the intent of the research), because it was assumed that the correlations between the variables would only be reduced, due to the increased variances from the order of scale presentation.

Simplex for Social Distance Items

All of the nine possible simplex structures for the intercorrelations of the nine social distance items were obtained, and therefore the hypothesis of the simplex order for the social distance items was supported. This finding lends support for a lateral structioned social distance scale of increasing complexity. While the items fall short of the ideal simplex, refinement of the social distance continuum should lead to more perfect simplexes and, consequently, better prediction. There appears to be an interaction of the social distance items with the attitude objects and joint structioned levels; this suggests that specific items may be more

valid for specific objects at specific attitude joint structioned levels than for other objects or levels.

In general, the "societal relations items" did not correlate very strongly with the "primary and secondary" relation items, but they did form part of the simplex structure, and therefore function as elements of the social distance continuum. Refinement of the societal relation items may be necessary. It may be that these items were not relevant or highly ego-involved. Conclusions concerning these items from these data is confounded, partially due to the fact that the sample was a homogeneous college population and highly sensitive to social inequalities implied in the societal relations items.

The hypothesized simplex structure of the facet derived subscales (the primary group relations, secondary group relations, and societal group relations subscales) was also obtained. This is not a surprising finding in that the individual social distance items formed a simplex. However, while seven of the nine possible simplexes formed simplex approximations, two were reversed in their order. These reversals may be due to the lack of clarity in the societal relations items (discussed above).

Smallest Space Analysis and the Structural Hypotheses

The a priori faceted mapping sentence (Figure 4 in Chapter III) predicted that three facets would partition the Cartesian space accepted by the correlations. This finding was confirmed in the smallest space analysis: the space could effectively be partitioned

by "object," joint level, and lateral structioned social distance dimensions. In the obtained structure, the joint structioned attitude levels served as an axial facet, the unordered attitude object served as a polarizing facet at each level, and the social distance (lateral structioned) facet served as a modulating dimension at each level. The structural hypothesis was thus confirmed: the a priori definition of the universe was predicted by the faceted design. The finding of the expected structure demonstrates the usefulness of facet theory in that the structure was predicted and thus further support for the construct validity of the metatheory of facets was obtained.

According to previous research, the stereotypic joint structioned level was expected to have fallen further away from the personal feeling joint structioned attitude level; the stereotypic dimension being the weakest, least complex structuple, and personal feeling being the strongest, with moral evaluation falling between the two. Therefore, it was expected that the joint structioned structuples of stereotypic, moral evaluation, and personal feeling would have fallen in that order along the axial facet. At this point speculation leads to the conclusion that the ordering principle of the earlier attitude research may be incorrect; or that the homogeneous college population was more likely to experience dissonance in their feelings as compared to what they judge is morally right or wrong with respect to various attitude objects.

The social distance subscores did modulate the distance from the axis at each level. The societal relations subscores appear

to function as a convergent subscore (i.e., these items are less likely to differentiate between objects) and the primary group relations subscores function as divergent and possibly polarizing items. While the order of the social distance modulating facet was not clearly obtained at each joint structioned level for each object, it was approximated; thus, the structure at each level for each object for the societal distance subscore did approximate the weak-to-strong (societal, secondary group, and primary group relations) ordering principle.

Although the three-dimensional space was open in many areas, it is important to recall that only three of the joint structioned levels were researched and that only nine social distance situations were examined. Increasing the number of social distance situations (lateral structioned situations) and investigating all six of the levels most likely would result in filling in more of the space. In addition, adding situations, clarifying the social distance items, and increasing the number of items, should also result in filling in the space and clarifying the structural relations. Also, increasing the number of objects would further tend to fill in the space. Nevertheless, the hypothesized cylindrex would still be expected to remain, provided that the variables were properly ordered.

In summary, smallest space analysis revealed the expected a priori structure: a cylindrex. Each of the major facets of the design played the expected roles in the cylindrex and thus further support for the construct validity of the concept of the metatheory of facets was obtained.

Factor Analysis

Orthogonal factor analysis utilizing the varimax rotation method resulted in seven factors. Again, this finding is consistent with previous research in that a greater space was necessary to explain the relations by factor analysis than by smallest space analysis. Therefore, it is concluded that smallest space analysis in comparison to factor analysis is a more parsimonious method.

Facet theory, then, in an *a priori* sense, provided the meaning for the dimensions which was obtained via the smallest space analysis. The implication for further research suggests that facet theory is a useful theory for designing research, specifying the content of the design, and predicting the outcome of the structure of the relations. Speculation concerning the usefulness of facet theory in designing experimental manipulations of variables in the classical experimental sense includes ordering the levels of independent variables, specifying relations between dependent variables where multiple dependent variables were utilized, and in general serving as a useful tool for formulating the research and predicting the outcome. While facet theory and the principles of structural order and structural relations and smallest space analysis are still in their infancy, many new developments are expected. As with any new approach, literature is difficult to locate and proponents few; it takes diligence and dedication for the researcher to follow facet theory and the construction of facetized designs.

Recommendations for Future Research

1. An ordering principle for attitude objects should be explored. Objects may be ordered by social distance, importance to the subject, ego involvement, etc.

2. The possibility of refining an equal interval unidimensional social distance (situations) scale should be explored. Selection of situation by ego involvement and relevance appears to be confounded, as it is not possible to have one without the other.

3. Further research with the existing or refined scales, with different, more heterogeneous populations and larger samples, is necessary in order to clarify the findings obtained in this study.

4. Designing an experiment to clarify the obtained interaction of attitude objects (i.e., how responding toward one attitude object may influence Ss responses to another object) may be fruitful in exploring the ordering principle for objects.

5. Studies examining the utility of facet theory in clinical and institutional settings should be designed. For example, is facet theory a useful technique in developing instrumentation to study a comprehensive health delivery system and the evaluation instruments required?

The following is based solely on the author's insights and intuitions. Facet theory seems to be a valuable technique in exploring the relationships of variables and in developing research designs and questions. It is indeed theory development. Smallest space analysis also seems to be a useful, easily understood technique which enables examination of correlational structure and

therefore the validity of the facet theory. Other useful applications of facet theory may be along the line of clinical uses, such as exploring the "facets" of personality of individual clients, the various elements which prove to become stronger and thus sensitize the patient, etc. In the study of institutions, one may be able to facetize the various dimensions and order corresponding elements.

Finally, facet theory appears to be heuristic as a useful framework for developing new scales and research designs. That is, the technique requires that all of the known facets and their elements be included in the design. This is not usually the case in typical factorial research. Instead, facet theory and the resultant mapping sentences require a logical concatenation of facets and their elements before the research is begun. Once the mapping sentences are complete, the theory has been stipulated and subsequently can be put to a scientific test.

APPENDICES

APPENDIX A

GLOSSARY

APPENDIX A

GLOSSARY*

Approximation--See "simplex approximation."

Attitude--"Delimited totality of behavior with respect to something" (Guttman, 1950, p. 51).

Content--Situation (action, feeling, comparison, circumstances) indicated in an attitude item; generally corresponds to "lateral struction."

Definitional statement--Specification of characteristics proper to an item of a given level member, typically stated in phrase or clause form.

Definitional system-Ordered group of definitional statements or of the corresponding level members; typically, either the group constituting a "semantic path" or the complete group of 12 level members in the "semantic map."

Directionality--Characteristic of an item, sometimes called positive or negative, determining agreement with the item as indicating favorableness or unfavorableness toward the attitude object.

Element--One of two or more ways in which a facet may be expressed; in the present system, all joint facets are dichotomous, expressed in one.

Facet--One of several semantic units distinguishable in the verbal expression of an attitude; in the present system, five dichotomous facets are noted within the joint struction.

Facet profile--See "struction profile."

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*Credit is given to Maierle (1969) and Gottlieb (1973) for most of the work in developing this glossary.

Interest group--Any group that, on the basis of one or more shared attitudes, makes certain claims upon other groups in the society for the establishment, maintenance, or enhancement of forms of behavior that are implied by the shared attitudes. Fundamentally, interest groups are the representation of homogeneous interests seeking influence. In the present study, they are functionally somewhat equivalent to "occupational groups."

Joint struction--See also "struction," lateral struction"--"operationally defined as the ordered sets of . . . five facets from low to high across all five facets simultaneously" (Jordan, 1968a, p. 76); that part of the semantic structure of attitude items which can be determined independently of specific response situations. Attitude levels; structuples which occur across levels for all possible attitude objects.

Lateral struction--Specific situations in which objects are placed; may vary dependent on object. See also "struction," "joint struction"--that part of the semantic structure of attitude items which is directly dependent on specification of situation and object; a more precise term than "content."

Level--Degree of attitude strength specified by the number of strong and weak facets in the member(s) of that level; in the present system, six ordered levels are identified: Level 1 is characterized by the unique member having five weak facets; Level 2, by members having four weak and one strong facet . . . Level 6, by the unique member having five strong facets.

Level member--One of one or more permutation(s) of strong and weak facets which are common to a given level; in the present system, 12 level members have been identified: three on Level 2, four on Level 3, two on Level 4, and one each on Levels 1, 5, and 6.

Map--See "semantic map."

Member--See "level member."

Path--See "semantic path."

Profile--See "struction profile."

Reversal--Change in a specified order of levels or of correlations, involving only the two indicated levels or correlations.

Semantic--Pertaining to or arising from the varying meanings, grammatical forms, or stylistic emphasis of words, phrases, or clauses.

Semantic map--Two-dimensional representation of hypothesized relationships among six levels and among 12 level members.

Semantic path--Ordered set of level members, typically six, such that each member has one more strong facet than the immediately preceding member and one less strong facet than the immediately following member.

Semantic possibility analysis--Linguistic discussion of the implications of the five dichotomous joint facets identified in the present system; of 32 combinations, only 12 are considered logically consistent.

Simplex--Specific form of (correlation) matrix, diagonally dominated and decreasing in magnitude away from the main diagonal; see Table 8 for comparison of equally spaced and unequally spaced diagonals.

Simplex approximation--Matrix which approaches more or less perfectly the simplex form; existing tests (Kaiser, 1962; Mukherjee, 1966) reflect both ordering of individual entries and sizes of differences between entries and between diagonals.

Strong(er)--Opposite of weak(er)--term functionally assigned to one of two elements, to a facet expressed by its strong element, or to a level member characterized by more strong facets than another level member; the strong-weak continuum is presently examined as unidimensional.

Struct--Elements of a facet.

Struction--See also "joint struction," "lateral struction"--semantic pattern identifiable in any attitude item, or the system of such identifications.

Struction profile--Specification, typically indicated by small letters and numerical subscripts, of the combination(s) of weak and strong elements or facets in a level member or a set of level members; or of combinations of lateral elements or facets.

Structuple--A combination of elements (structs) from the facets in a design.

Transposition--Change in a specified order of levels or correlations involving a change in position of one level or correlation and the corresponding one-place shift in the position of following or preceding levels or correlations.

Weak--Opposite of "strong" (see "strong").

APPENDIX B

ATTITUDE-BEHAVIOR SCALE:

ABS-BK, MR, BD

APPENDIX B

ATTITUDE-BEHAVIOR SCALE: ABS-BK, MR, BD

Instructions

You should have received a booklet of questions, a pencil, and an answer sheet. Since your answers to these questions are confidential, and we guarantee your anonymity, DO NOT write your NAME anywhere on the booklet or answer sheet.

NOTE: The booklet contains statements of how people behave in certain situations, or feel about certain things. You, yourself, or other persons, often behave in the same way, or sometimes you feel or behave differently than others.

The questions are about racial groups, the mentally retarded, and blind persons. Although some of the statements may appear similar, each statement is different. Your answer to the questions in each section may or may not be the same from section to section.

RECORDING YOUR ANSWER:

The answer sheet (IBM answer sheet) is to be filled out in the following manner.

Sample Question: Other people believe the following things:

1. This college is the best college in the world.
    1. strongly disagree
    2. disagree
    3. agree
    4. strongly agree

If other people strongly agree with this statement, you should shade the number 4 as shown on your IBM answer sheet.

1. 

Note that your answer sheet has a few of the boxes already shaded; this simply indicates for us which form of the booklet you are answering. Now turn the page and begin answering the questions. Note also that we have different instructions for each section. Please read the instructions carefully. Your answer for each question may change within the section.

**********PLEASE DO NOT WRITE IN THIS BOOKLET**********

BLACK-1

In this section you are asked to indicate how most other people believe that Black people compare to those who are not Blacks.

Others believe the following things about Blacks as compared to Whites.

1. Others believe that they would not accept Blacks as well as Whites as a close family member.

   1. strongly agree
   2. agree
   3. disagree
   4. strongly disagree

2. Others believe that they would accept Blacks as well as Whites.

   1. strongly disagree
   2. disagree
   3. agree
   4. strongly agree

3. Others believe that they can trust Blacks as well as Whites with their money.

   1. strongly disagree
   2. disagree
   3. agree
   4. strongly agree

4. Others believe that they would accept Blacks as well as Whites to live next door as neighbors.

   1. strongly disagree
   2. disagree
   3. agree
   4. strongly agree

5. Others believe that they would accept Blacks as well as Whites as a member of their church community.

   1. strongly disagree
   2. disagree
   3. agree
   4. strongly agree

6. Others believe that they would accept Blacks as well as Whites as fellow workers.

   1. strongly disagree
   2. disagree
   3. agree
   4. strongly agree

7. Others believe that Blacks have the same eduational opportunities as Whites.

   1. strongly disagree
   2. disagree
   3. agree
   4. strongly agree

8. Others believe that Blacks have the same citizenship rights as Whites.

   1. strongly disagree
   2. disagree
   3. agree
   4. strongly agree

9. Others believe that Blacks are not as satisfied as Whites with their status in our society.

   1. strongly disagree
   2. disagree
   3. agree
   4. strongly agree

TURN TO THE NEXT PAGE

BLACK-2

This section contains statements of the right or wrong way of behaving or acting toward Blacks. You are asked to indicate what you think others believe is right or wrong with respect to Blacks.

In respect to Blacks, what do you think others believe is right or wrong?

10. When others expect Blacks to be accepted as well as Whites as close family members, they are

    1. wrong
    2. usually wrong
    3. usually right
    4. right

11. When others expect Blacks to be accepted as well as Whites for close personal friends, they are

    1. wrong
    2. usually wrong
    3. usually right
    4. right

12. When others trust Blacks as well as Whites with their money, they are

    1. wrong
    2. usually wrong
    3. usually right
    4. right

13. When others do not accept Blacks as well as Whites to live as next door neighbors, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

14. When others do not accept Blacks as well as Whites as a member of their church community, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

TURN TO THE NEXT PAGE

15. When others accept Blacks as well as Whites as a fellow worker, they are

    1. wrong
    2. usually wrong
    3. usually right
    4. right

16. When others do not expect Blacks to have the same educational opportunities as Whites, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

17. When others do not expect Blacks to have the same citizenship rights as Whites, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

18. When others expect Blacks to be as satisfied as Whites with their status in our society, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

TURN TO THE NEXT PAGE

BLACK-3

This section concerns actual feelings that you yourself may have about Blacks. You are asked to indicate how you feel about Blacks as compared to Whites.

How do you actually feel about Blacks?

19. When Blacks are not as accepted as Whites as close family members, I feel

    1. very happy
    2. happy
    3. angry
    4. very angry

20. When Blacks are not as accepted as well as Whites for close personal friends, I feel

    1. very happy
    2. happy
    3. angry
    4. very angry

21. When Whites also trust Blacks as well as Whites with their money, I feel

    1. very satisfied
    2. satisfied
    3. dissatisfied
    4. very dissatisfied

22. When Blacks are not as accepted as well as Whites for neighbors, I feel

    1. very good
    2. good
    3. bad
    4. very bad

23. When Blacks are not accepted in a church community as well as Whites, I feel

    1. very good
    2. good
    3. bad
    4. very bad

TURN TO THE NEXT PAGE

24. When Blacks are not accepted as well as Whites for felow workers, I feel

    1. very good
    2. good
    3. bad
    4. very bad

25. When Blacks do not have the same educational opportunities as Whites, I feel

    1. very satisfied
    2. satisfied
    3. dissatisfied
    4. very dissatisfied

26. When Blacks are not allowed the same citizenship rights as Whites, I feel

    1. very happy
    2. happy
    3. angry
    4. very angry

27. When Blacks are not as satisfied as Whites with their status in our society, I feel

    1. very angry
    2. angry
    3. happy
    4. very happy

TURN TO THE NEXT PAGE

MR-1

In this section you are asked to indicate how most other people believe that mentally retarded people compare to those who are not retarded.

Others believe the following things about mentally retarded as compared to non-retarded.

28. Others believe that they would not accept mentally retarded as well as a non-retarded person as a close family member.

    1. strongly agree
    2. agree
    3. disagree
    4. strongly disagree

29. Others believe that they would accept a mentally retarded as well as a non-retarded person as a close personal friend.

    1. strongly disagree
    2. disagree
    3. agree
    4. strongly agree

30. Others believe that they can trust mentally retarded as well as non-retarded with their money.

    1. strongly disagree
    2. disagree
    3. agree
    4. strongly agree

31. Others believe that they would accept mentally retarded as well as non-retarded to live next door as neighbors.

    1. strongly disagree
    2. disagree
    3. agree
    4. strongly agree

32. Others believe that they would accept mentally retarded as well as non-retarded as a member of their church community.

    1. strongly disagree
    2. disagree
    3. agree
    4. strongly agree

TURN TO THE NEXT PAGE

33. Others believe that they would accept mentally retarded as well as non-retarded as fellow workers.

    1. strongly disagree
    2. disagree
    3. agree
    4. strongly agree

34. Others believe that the mentally retarded have the same educational opportunities as non-retarded.

    1. strongly disagree
    2. disagree
    3. agree
    4. strongly agree

35. Others believe that the mentally retarded have the same citizenship rights as the non-retarded.

    1. strongly disagree
    2. disagree
    3. agree
    4. strongly agree

36. Others believe that the mentally retarded are not as satisfied as the non-retarded with their status in our society.

    1. strongly disagree
    2. disagree
    3. agree
    4. strongly agree

TURN TO THE NEXT PAGE

MR-2

This section contains statements of the right or wrong way of behaving or acting toward the mentally retarded. You are asked to indicate what you think others believe is right or wrong with respect to mentally retarded persons.

In respect to mentally retarded, what do you think others believe is right or wrong.

37. When others expect mentally retarded to be accepted as well as the non-retarded as close family members, they are

    1. wrong
    2. usually wrong
    3. usually right
    4. right

38. When others expect the mentally retarded to be accepted as well as non-retarded for a close personal friend, they are

    1. wrong
    2. usually wrong
    3. usually right
    4. right

39. When others trust the mentally retarded as well as non-retarded with their money, they are

    1. wrong
    2. usually wrong
    3. usually right
    4. right

40. When others do not accept mentally retarded as well as non-retarded to live next door as neighbors, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

TURN TO THE NEXT PAGE

41. When others do not accept the mentally retarded as well as the non-retarded as a member of their church community, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

42. When others accept mentally retarded as well as non-retarded as fellow workers, they are

    1. wrong
    2. usually wrong
    3. usually right
    4. right

43. When others do not expect mentally retarded to have the same educational opportunities as non-retarded, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

44. When others do not expect the mentally retarded to have the same citizenship rights as non-retarded, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

45. When others expect the mentally retarded to be as satisfied as the non-retarded with their status in our society, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

TURN TO THE NEXT PAGE

MR-3

This section concerns actual feelings that you yourself may have about the mentally retarded. You are asked to indicate how you feel about mentally retarded as compared to non-retarded.

How do you actually feel about the mentally retarded?

46. When mentally retarded are not as accepted as non-retarded as close family members, I feel

    1. very happy
    2. happy
    3. angry
    4. very angry

47. When mentally retarded are not as accepted as well as non-retarded as close personal friends, I feel

    1. very happy
    2. happy
    3. angry
    4. very angry

48. When non-retarded also trust mentally retarded as well as non-retarded with their money, I feel

    1. very satisfied
    2. satisfied
    3. dissatisfied
    4. very dissatisfied

49. When the mentally retarded are not as accepted as well as non-retarded for next door neighbors, I feel

    1. very good
    2. good
    3. bad
    4. very bad

50. When the mentally retarded are not accepted in a church community as well as non-retarded, I feel

    1. very good
    2. good
    3. bad
    4. very bad

TURN TO THE NEXT PAGE

51. When the mentally retarded are not accepted as well as non-retarded for fellow workers, I feel

    1. very good
    2. good
    3. bad
    4. very bad

52. When the mentally retarded do not have the same educational opportunities as non-retarded, I feel

    1. very satisfied
    2. satisfied
    3. dissatisfied
    4. very dissatisfied

53. When the mentally retarded are not allowed the same citizenship rights as non-retarded, I feel

    1. very happy
    2. happy
    3. angry
    4. very angry

54. When the mentally retarded are not as satisfied as the non-retarded with their status in our society, I feel

    1. very angry
    2. angry
    3. happy
    4. very happy

TURN TO THE NEXT PAGE

BLIND-1

In this section you are asked to indicate how most other people believe that the blind compare to those who are not blind.

Others believe the following things about the blind as compared to the sighted.

55. Others believe that they would not accept a blind as well as a sighted person as a close family member.

    1. strongly agree
    2. agree
    3. disagree
    4. strongly disagree

56. Others believe that they would accept a blind as well as a sighted person as a close personal friend.

    1. strongly disagree
    2. disagree
    3. agree
    4. strongly agree

57. Others believe that they can trust the blind as well as the sighted with their money.

    1. strongly disagree
    2. disagree
    3. agree
    4. strongly agree

58. Others believe that they would accept the blind as well as the sighted to live next door as neighbors.

    1. strongly disagree
    2. disagree
    3. agree
    4. strongly agree

TURN TO THE NEXT PAGE

59. Others believe that they would accept the blind as well as the sighted as a member of their church community.

1. strongly disagree
2. disagree
3. agree
4. strongly agree

60. Others believe that they would accept the blind as well as the sighted as fellow workers.

1. strongly disagree
2. disagree
3. agree
4. strongly agree

61. Others believe that the blind have the same educational opportunities as the sighted.

1. strongly disagree
2. disagree
3. agree
4. strongly agree

62. Others believe that the blind have the same citizenship rights as the sighted.

1. strongly disagree
2. disagree
3. agree
4. strongly agree

TURN TO THE NEXT PAGE

BLIND-2

This section contains statements of the right or wrong way of behaving or acting toward the blind. You are asked to indicate what you think others believe is right or wrong with respect to the blind.

In respect to the blind, what do you think others believe is right or wrong?

64. When others expect the blind to be accepted as well as the sighted as close family members, they are

1. wrong
2. usually wrong
3. usually right
4. right

65. When others expect the blind to be accepted as well as the sighted as a close personal friend, they are

1. wrong
2. usually wrong
3. usually right
4. right

66. When others trust the blind as well as the sighted with their money, they are

1. wrong
2. usually wrong
3. usually right
4. right

67. When others do not accept the blind as well as the sighted to live next door as neighbors, they are

1. right
2. usually right
3. usually wrong
4. wrong

68. When others do not accept the blind as well as the sighted as a member of their church community, they are

1. right
2. usually right
3. usually wrong
4. wrong

TURN TO THE NEXT PAGE

69. When others accept the blind as well as the sighted as fellow workers, they are

    1. wrong
    2. usually wrong
    3. usually right
    4. right

70. When others do not expect the blind to have the same educational opportunities as the sighted, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

71. When others do not expect the blind to have the same citizenship rights as the sighted, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

72. When others expect the blind to be as satisfied as those who are sighted with their status in society, they are

    1. right
    2. usually right
    3. usually wrong
    4. wrong

TURN TO THE NEXT PAGE

BLIND-3

This section concerns actual feelings that you yourself may have about the blind. You are asked to indicate how you feel about the blind as compared to the sighted.

How do you actually feel about the blind?

73. When the blind are not as accepted as the sighted as a close family member, I feel

    1. very happy
    2. happy
    3. angry
    4. very angry

74. When the blind are not accepted as well as the sighted for close personal friends, I feel

    1. very happy
    2. happy
    3. angry
    4. very angry

75. When the sighted also trust the blind as well as the sighted with their money, I feel

    1. very satisfied
    2. satisfied
    3. dissatisfied
    4. very dissatisfied

76. When the blind are not accepted as well as the sighted for next door neighbors, I feel

    1. very good
    2. good
    3. bad
    4. very bad

77. When the blind are not accepted in a church community as the sighted, I feel

    1. very good
    2. good
    3. bad
    4. very bad

TURN TO THE NEXT PAGE

78. When the blind are not accepted as well as the sighted for fellow workers, I feel

    1. very good
    2. good
    3. bad
    4. very bad

79. When the blind do not have the same educational opportunities as the sighted, I feel

    1. very satisfied
    2. satisfied
    3. dissatisfied
    4. very dissatisfied

80. When the blind are not allowed the same citizenship rights as the sighted, I feel

    1. very happy
    2. happy
    3. angry
    4. very angry

81. When the blind are not as satisfied as the sighted with their status in our society, I feel

    1. very angry
    2. angry
    3. happy
    4. very happy

TURN TO THE NEXT PAGE

82. Please indicate your sex.

1. female
2. male

83. To which racial group do you belong?

1. Black
2. White
3. Oriental
4. other

84. Please indicate your age as follows:

1. under 20
2. 20-30
3. 31-45
4. over 45

85. What is your marital status?

1. single
2. married
3. divorced
4. widowed

86. What is your religion?

1. Catholic
2. Protestant
3. Jewish
4. other

87. Please indicate your level of education.

1. college freshman
2. college sophomore
3. college junior
4. college senior

88. Where were you mainly "brought up" in your youth?

1. country
2. country town
3. city suburb
4. city

89. The following questions have to do with kinds of experiences you have had with Blacks. If more than one experience applies, please choose the answer with the highest number.

1. I have read or studied about Blacks through reading, movies, lectures or observations.
2. A friend or relative is a Black.
3. I have personally worked with Blacks as teacher, counselor, volunteer, child care, etc.

90. Considering all of the times you have talked, worked, or in some other way had personal contact with Blacks, about how much has it been altogether?

1. only a few casual contacts
2. between one and three months
3. between three and six months
4. between six months and one year
5. more than one year of contact

91. When you have been in contact with Blacks, how easy for you, in general, would you say it would have been to have avoided being with them?

1. I have had no contact.
2. I could generally have avoided these personal contacts only at great cost or difficulty.
3. I could generally have avoided these personal contacts but with some inconvenience.
4. I could generally have avoided these personal contacts without any difficulty or inconvenience.

92. How have you generally felt about your experience with Blacks?

1. no experience.
2. I definitely dislike it.
3. I did not like it very much.
4. I like it somewhat.
5. I definitely enjoyed it.

93. The following questions have to do with kinds of experiences you have had with mentally retarded. If more than one experience applies, please choose the answer with the highest number.

1. I have read or studied about mentally retarded through reading, movies, lecture or observation.
2. A friend or relative is mentally retarded.
3. I have personally worked with the mentally retarded, as a teacher, counselor, volunteer, care, etc.

94. Considering all of the times you have talked, worked or in some way had personal contact with mentally retarded, about how much has it been altogether?

1. only a few casual contacts
2. between one and three months
3. between three months and six months
4. between six months to one year
5. more than one year of contact

95. When you have been in contact with the mentally retarded, how easy for you, in general, would you say it would have been to have avoided being with them?

1. I have had no contact.
2. I could generally have avoided these personal contacts only at great cost or difficulty.
3. I could generally have avoided these personal contacts but with some inconvenience.
4. I could generally have avoided these personal contacts without any difficulty or inconvenience.

96. How have you generally felt about your experiences with mentally retarded?

1. no experience
2. I definitely dislike it.
3. I did not like it very much.
4. I like it somewhat.
5. I definitely enjoyed it.

97. The following questions have to do with kinds of experiences you have had with the blind. If more than one experience applies, please choose the answer with the highest number.

1. I have read or studied about the blind through reading, movies, lectures or observation.
2. A friend or relative is blind.
3. I have personally worked with the blind as a teacher, counselor, volunteer, care, etc.

98. When you have been in contact with the blind, how easy for you, in general, would you say it would have been to have avoided being with them?

1. I have had no contact.
2. I could generally have avoided these personal contacts only at great cost or difficulty.
3. I could generally have avoided these personal contacts but with some inconvenience.
4. I could generally have avoided these personal contacts without any difficulty or inconvenience.

99. Considering all of the times you have talked, worked or in some way had personal contact with the blind, about how much time has it been altogether?

    1. only a few contacts
    2. between one and three months
    3. between three months and six months
    4. between six months and one year
    5. more than one year of contact

100. How have you generally felt about your experiences with blind people?

    1. no experience
    2. I definitely dislike it.
    3. I did not like it very much.
    4. I definitely enjoyed it.

Thank you. Your cooperation is greatly appreciated.

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