PERSONALITY CHARACTERISTICS AND CONSUMER-PRODUCT PERCEPTIONS: METHODOLOGICAL ADVANCES AND EMPIRICAL VERIFICATION OF A COGNITIVE MODEL

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ABSTRACT

PERSONALITY CHARACTERISTICS AND CONSUMER-PRODUCT PERCEPTIONS: METHODOLOGICAL ADVANCES AND EMPIRICAL VERIFICATION OF A COGNITIVE MODEL

By

Leighton Adams Price

Objectives

Psychological theories of complex perceptual-cognitive phenomena generally suggest that broad cognitive characteristics are related to perception of rather specific stimuli; nevertheless, empirical support for such relationships has been meager. The study of consumer behavior is one such area where general characteristics (e.g., personality measurements) and specific characteristics (e.g., consumer-product perceptions) have seldom been found to be related to each other as logically expected. It remains possible, however, that the meager evidence is symptomatic of theoretical and methodological deficiencies rather than weak relationships in the actual phenomena.

The present research was based on the assumption that theoretical and methodological deficiencies have contributed importantly to this state of affairs. Consequently, the research was concerned simultaneously with:

1. Utilizing a model of perceptual-cognitive processes incorporating constructs which were adequately matched with the complexities of the phenomena involved.

2. Utilizing a methodology which realistically matched data collection and analysis with the complexity of the constructs in the model.

3. Performing empirical tests of relationships between two classes of cognitive phenomena described by the model (i.e., rather general cognitive characteristics represented by personality measures and more specific cognitive characteristics represented by sterling tableware perceptions).

The cognitive model and the methodology developed for the present research have their immediate origins in the typological theories and pattern-analytic methods of McQuitty, in Stephenson's Q-methodology, in Osgood's model of meaning systems and Semantic Differential, in Fishbein's model of attitude formation and methods for measuring attitude, as well as in Rokeach's theory of belief-value systems. The new model seeks to integrate and extend existing models so that the inherent complexity of perceptual-cognitive phenomena may be more adequately conceptualized. The methodology seeks to capture the detail and organization of perceptual-cognitive phenomena while simultaneously relaxing measurement and statistical constraints.

Results

1. Logically expected relationships between personality and consumer-product perceptions were obtained through analysis

of data collected from an appropriate sample of university women having varying degrees of interest in sterling tableware design. These results, in turn, provided indirect support for the validity of the new model despite the demanding empirical context for the research.

a. Two rather different kinds of personality variables (i.e., cognitive content and cognitive structure variables) were found to relate to sterling tableware perceptions in theoretically expected ways. In particular, homogenous but contrasting personality "types" differed in the content, response-style, and structural characteristics of their perceptions. Since these analyses were performed for several related inventories, a quasi multi-trait multi-method cross-validation was achieved.

b. Indirect support for the validity of the model manifested itself on several levels. Aggregate analyses of personality "types" yielded content, response-style, and structural results supporting basic constructs of the model. These analyses also indicated that within-type similarities could realistically be treated as a system. Analyses for individuals indicated that evidence of broad cognitive constructs could be captured in the detailed responses of single individuals.

2. The strength of the hypothesized relationships also held many implications for the merits of the present data collection and analysis methods.

a. The principal technique developed to measure sterling tableware perceptions (the Object Descriptions Task) constituted a realistic yet easily constructed and versatile instrument. Unique characteristics of the task provided some of the main differentiations between content, response-style, and structural characteristics of contrasting "types."

b. Methods developed to analyze the masses of perceptual detail yielded by the Object Descriptions Task were clearly sensitive to both the content and organization of cognitive phenomena. Conventional methods would have been hard pressed to handle such masses of data without imposing more severe measurement and statistical constraints. It should be noted, however, that the present methods would not have been feasible without computers.

Applications

The most obvious applications of the model and methodology center on consumer behavior (e.g., analyses of product image, relationships among competitive products, segmentation by personality characteristics, changes in product perception over time). Nevertheless, these are merely examples of the many ways that the model and methodology could be employed. The research strategy is a comprehensive one applicable to many problems in the social sciences, and it may even be directed toward several problems simultaneously. As a result, the methodology can help to achieve research efficiency while the model helps to achieve parsimony in explanation.

Even though models and methods are never really developed as much as they might be, the strength of the results indicates that the present model and methodology are formidable competitors of existing approaches and that they are sufficiently well developed to be used in applied research.

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By

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I should also like to extend my gratitude to Dr. Eugene H. Jacobson, Dr. William D. Crano, and Dr. William J. E. Crissy. Numerous aspects of the present research strategy took shape in the course of discussions with them. In addition, these discussions were directly responsible for focusing analyses upon the content, response-style, and structural characteristics of object perceptions manifested by contrasting personality types.

While the research was not explicitly concerned with non-verbal communication, this area of investigation was clearly relevant to the development of the present model and methodology. In this regard, Dr. Randall P. Harrison of the Department of Communication contributed importantly to the evolution of thinking which culminated in the present research.

Special debts of gratitude are also owed to Dr. Louis L. McQuitty and Dr. James A. Clark. Their ideas on typological analysis and data collection in the social sciences constituted the major stimuli for pilot research from which the present model and methods evolved. I also found their reactions to my own ideas to be both perceptive and constructive.

I should also like to thank Dr. Charles F. Wrigley of the Computer Institute for Social Science Research for supporting the extensive computer time needed to develop analysis methods used in the research and to analyze the data collected, for funding a number of qualified undergraduates apprentices to help program several of the methods for computers and to assist with some of the analyses.

Financial support for persons hired to help prepare materials, to assist with data collection, and to code data for analysis was also provided by a Biomedical Sciences Support Grant (FRO 7049-03).

The sterling silver tableware used in the research was generously loaned to me by the Gorham Corporation of Providence, Rhode Island. Several hundred forks covering a broad range of styles were provided. These designs were used in both pilot research and the research reported here.

Finally, I should like to dedicate this dissertation to my wife, Dorothy, who has provided moral support for carrying out this research and has contributed to it through valuable critical discussion and extensive amounts of typing, to our children, Diana and David, who have endured the demands of carrying out the numerous phases of this research, and to my father, Mr. J. Russell Price, whose own work in

the area of consumer preferences stimulated several of the data collection and analysis methods developed as part of the present research.

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CHAPTER I

THE PROBLEM OF STUDYING COMPLEX PERCEPTUAL-COGNITIVE PROCESSES

Introduction

Psychologists concerned with cognitive organization generally agree that the perceptual-cognitive representations of many stimuli are quite complex. For example, the mental processes associated with abstract objects (e.g., social roles, self-image, or ideologies) and with many everyday physical objects (e.g., buildings, consumer products, or other people) are generally viewed as being inherently complex. Despite this consensus, many of the models and research techniques which psychologists devise seem to fall short of capturing the essential complexities of the underlying perceptual-cognitive phenomena. The sorts of problems encountered with existing models and methods are that: (1) models tend to oversimplify the phenomena involved, (2) techniques for collecting perceptual-cognitive data often impose unnecessary constraints to achieve quantification, and (3) analysis techniques tend to impose statistical constraints which may further prohibit discovering important characteristics of the processes involved.

The thesis here is that models of complex cognitive organization as well as techniques for studying these systems can be improved appreciably by treating model building and methodological developments as interdependent aspects of the research process. The model and the methods developed for the present investigation are offered as efforts toward integrating and extending existing knowledge of perceptual-cognitive phenomena by more fully and more realistically accounting for the complexity of such phenomena.

The present research has focused on the perceptual-cognitive processes (or systems of meanings) representing two rather different sorts of objects: (1) the abstract object called self-image or personality, and (2) material objects belonging to a class of consumer products (sterling silver tableware). With respect to self-image, the underlying systems of meanings were studied through the use of personality inventories. For the consumer products selected, the underlying meaning-systems were measured and analyzed with methods developed especially for this research. It is expected, however, that the model and the methodology employed should apply equally well to a wide variety of other abstract and material objects.

Personality characteristics and consumer products were originally selected for the purpose of examining theoretical and practical questions related to consumer behavior. However, in the broader context of evaluating a model of complex perceptual-cognitive representations, they mainly provided the conditions for testing the idea that apparently dissimilar objects may be psychologically related. Personality traits emerge from an individual's life experiences and pertain to rather general behavior patterns. While sterling tableware

is often an integral part of a social setting and hence may gain symbolic significance, many of the responses to these products are likely to be specific to the immediate object and situation. In other words, the systems of symbolic meanings representing these objects are unlikely to overlap unless there are substantial relationships between these symbolic domains.

The significance of seeking relationships between representations for different sorts of objects derives from the fact that psychologists have frequently been unsuccessful in finding relationships between general characteristics, such as personality traits, and the more specific representations for everyday objects in the real world. If stable relationships are revealed by the present approach and these relationships also make psychological sense, then it may be tentatively concluded that consumer-product perceptions are, in part, reflections of an individual's personality traits. More importantly, such results would provide some indirect support for both the present model of complex meaning-systems and the research strategy employed. Most importantly, progress would be achieved toward better operationalization, mapping and understanding of complex perceptual-cognitive systems.

In order to test the model developed for this research, it was necessary to develop both data collection and analysis techniques. Specifically, the methodological contributions of the research lie in the development of: (1) a technique for collecting more realistically complex perceptual-cognitive data, (2) operationalizations of a model which make it possible to quantify relationships among meanings,

(3) methods for analyzing the content and organization of meaning-systems, (4) methods for comparing the content and organization of different meaning-systems, and (5) computer programs for performing many of the complex data management and analysis tasks of mapping and comparing perceptual-cognitive systems. Extensive developmental work has gone into these methods, and the research reported here is a first effort to explore their potential and to obtain ideas for further development.

The methodology of the present research is clearly dependent upon the use of large-scale computers, and the computer programs developed to help make sense of complex perceptual-cognitive data may very well constitute some of the more enduring contributions of the research. In the absence of large-scale computer facilities, neither the developmental work nor the empirical efforts to unravel the complexities of meaning-systems would have been feasible.

Origins of the Model and Research Strategy

The concern of this investigation with the development of a model and its accompanying methods has its origins with McQuitty's interest in the mutual development of theory and method for hierarchical pattern-analysis (e.g., McQuitty, 1959; McQuitty, 1966b; McQuitty, 1967).

For some years, McQuitty has stressed the importance of regarding the development of typological theory and typological analysis methods as interdependent aspects of his research. The writer has extended this viewpoint to include operationalizations

making data collection compatible with the model and with the data analysis methods.

While the general form of the present investigation was originally inspired by a typological and pattern-analytic study of cognitive systems for individuals (McQuitty, Abeles, and Clark, 1970), both the model and methods used in this study have evolved to the point where they are now rather remote from their origins. For example, in the course of conducting pilot research using pattern-analytic techniques to analyze a single individual's perceptions of several consumer products (McQuitty, Price, and Clark, 1967), it was found that data collection techniques devised for the study were related to certain definitions of attitude (e.g., Rokeach, 1968). As a result, relationships of these measurement techniques to existing attitude measures were explored and some aspects of the present model began to take shape.

In subsequent pilot research (Price, 1968), when McQuitty's methods were again used to study relationships between personality characteristics and consumer-product perceptions, evidence showed that hierarchical pattern-analysis revealed connections between belief-value systems (as defined by Rokeach, 1960, 1968) and certain perceptual-cognitive representations of consumer-products. However, while attempting to analyze these data, the writer discovered a number of deficiencies in McQuitty's hierarchical clustering techniques and developed an alternative clustering method which attempted to avoid some of these deficiencies (Price, 1969).

While developing data collection methods for the present investigation, it occurred to the writer that many of the ideas which underlie the model and its operationalizations have much in common with Osgood's (Osgood, et al., 1957; Osgood, 1962, 1965) notions of semantic space, with consistency models of cognitive organization (e.g., Abelson, 1959; Abelson and Rosenberg, 1958; Cartwright and Harary, 1956; Heider, 1946; Rosenberg, 1956, 1960), and with behavioral models of attitude organization (Fishbein, 1967a, 1967b, 1967c; Rhine, 1958). As a result, the present technique for collecting perceptual-cognitive data has some of the features of the Semantic Differential (Osgood, et al., 1957), as well as features of an attitude measurement technique based on beliefs about objects and the evaluative aspects of those beliefs (Fishbein and Raven, 1962; Anderson and Fishbein, 1965).

It should also be noted that, in addition to McQuitty's influence upon the choice of analytic techniques, the techniques developed especially for this research were influenced by other researchers as well. For example, techniques for identifying personality types and comparing the mappings of different types were influenced by the Q-methodology of Stephenson (1953). Similarly, techniques for analyzing the organization of meaning-systems for different types were influenced by an exact-pattern clustering method developed by Clark (1968).

An Overview of the Objectives of This Research

The objectives of this research fall into three categories: theoretical, methodological, and practical.

Theoretical Objectives

The theoretical objectives of this thesis were: (1) to develop a model of complex perceptual-cognitive processes which attempts to integrate a number of existing models while simultaneously going beyond the scope of these models, and (2) to test the resulting model by applying it to the study of relationships between personality characteristics and consumer-product perceptions.

Although the model is not radically different from existing models of perceptual-cognitive systems, it appears to have several advantages over them. First, it provides a theoretical framework from which reasonably precise operationalizations may be derived. In the second place, several theoretical viewpoints may be seen as but different aspects of the same general model. Third, the model takes factors into account which are generally either ignored or not as well operationalized as they might be. In other words, the model may provide a closer approximation than existing models to the way perceptual-cognitive processes actually work.

The approach to testing the model was based on the assumption that an individual's life experiences can simultaneously affect numerous cognitive domains. Specifically, it was assumed that: (1) personality characteristics could be taken as examples of the built-in effects of long-term life experiences, (2) the symbolic

representations for certain consumer products could be taken as examples of a rather specific cognitive domain, and (3) these two rather different domains could become interrelated through common or related experiences. While the testing of the model has many implications for the psychology of consumer behavior, it might also help to provide insights into the dynamics of complex meaning-systems.

Personality variables were selected for use in the present research for two main reasons: (1) they provide broad and well-researched, though often somewhat unreliable, measures of cognitive behavior patterns, and (2) self-image (as measured through the self-report items of personality measures) may be expected to be fundamentally different from the highly specific sorts of responses given for consumer products. In brief, it should be difficult to find relationships between these two rather different classes of responses unless: (1) the objects are linked through related experiences in physical-social settings, (2) similar systems of symbolic meanings are associated with both sorts of objects, and (3) the research methods employed are realistically sensitive to the content and organization of the perceptual-cognitive systems under consideration.

The tests of relationships between personality variables and consumer-product perceptions were severe in other respects as well. For one, personality measures certainly oversimplify the actual situation to achieve quantification. Furthermore, personality measures all too seldom have been found to correlate with other variables. Because of such considerations, it should be doubly difficult to find relationships between general personality measures

and specific responses to consumer products. On the other hand, should relationships be found, these relationships would provide support for the model as well as inferential validity for the personality measures employed.

Methodological Objectives

To adequately test the model of complex perceptual-cognitive representations for objects, it was, as mentioned earlier, necessary to devise data collection and data analysis techniques that would operationalize the theoretically generated components of the model. As a result, efforts to test the model were simultaneously efforts to test the utility of data collection and analysis techniques which operationalize the model.

Collecting Complex Perceptual-Cognitive Data.--The problem of measuring the meanings associated with consumer products and other real-life stimuli is the familiar one of determining how physical reality is perceived and what psychological representations are achieved for these stimuli. While many techniques for collecting complex data are restricted to somewhat global responses, the thrust of this research has been to work toward obtaining detailed and specific reactions to objects.

The data collection techniques developed for the present research facilitate obtaining a maximum amount of associational information from respondents instead of asking them to give responses summarizing their reactions. Respondents were asked to rapidly record a very large number of highly specific reactions; they were

not asked to summarize their reactions or give overall impressions. As a result, the burden was put on the quantitative methods used to summarize these masses of perceptual-cognitive responses.

Analyzing Complex Perceptual-Cognitive Processes.--Two assumptions important in the development of the analysis methods were that: (1) the meanings associated with any object take the form of complex response syndromes or structures, and (2) the characteristics of these complex responses differ from one personality "type" to another. These assumptions pose an enormous challenge for analysis methods. The methods should be capable of handling both linear and nonlinear relationships and, at the same time, be able to differentiate between the various parts of meaning systems or between personality "types." In other words, it is important to use analytic techniques capable of handling highly flexible and varying content.

As mentioned earlier, the analysis techniques used in this research were influenced both by type-identifying methods developed by Stephenson (1953) and by pattern-analytic methods developed by McQuitty (1967). Stephenson's influence manifests itself mainly in the use of a Q-methodology approach to identifying personality types and to comparing the results of analyses for different types. However, with respect to the means by which types were identified and perceptual-cognitive processes were analyzed, the methodology was influenced more by McQuitty.

Although McQuitty was himself strongly influenced by Stephenson's work, he argued that potentially nonlinear systems should be analyzed with pattern-analytic techniques rather than factor analyses,

thereby avoiding the assumption of linearity and other constraints. McQuitty's impact on the present research is reflected in the fact that personality types were identified with cluster analysis and that object associations were also cluster-analyzed.

Despite these similarities with other methods, there are several ways in which the present methodology differs from its antecedents. Most importantly, the methodology is distinguished by the fact that two psychologically very different classes of perceptual-cognitive phenomena are being related to one another: personality characteristics and consumer-product representations. Traditionally, cluster analysis has been applied in studies of single content areas. In the present research, however, a typological approach has been combined with distribution and cluster analyses of meaning-systems for the purpose of studying relationships between the meaning-systems underlying responses to personality inventories, on the one hand, and responses to consumer products, on the other hand.

Practical Objectives

While applications have not been given direct attention in this thesis, the model and the methodology developed for the research have many practical implications. The practical objectives of the research were, therefore, to consider some of the ways in which the model and methodology might be employed in the real world.

Initially, some consideration was given to the implications of this research for similar research in the area of consumer behavior, its applicability to a broad range of marketing problems, and its

still more general applicability to other research problems in the social sciences.

Second, since the data collection techniques developed for this research were intended to be highly versatile, a number of specific applications in the area of consumer behavior were considered. For example, in addition to the present use of the techniques to test theoretical questions concerning complex perceptual-cognitive phenomena, the techniques might be used to study people's images of particular products, relationships among products in a line of goods, desired characteristics of products, similarities of product perceptions among the members of demographically or psychologically defined market segments, intensive analysis of people's perceptions of a particular product, and many others. The data collection techniques sought to provide a common, psychologically based, unit of measurement which could be used in studies involving different content, objects, and persons. That is, the techniques hopefully could bring some measurement efficiency to areas of research which have proliferated different measurement techniques for each content area needing measurement instead of developing a single technique which may be adapted to different problems. For example, techniques for studying likes and dislikes for products traditionally have been quite different from those used to determine why people react as they do.

Finally, the practical merits of employing a typological research strategy and the set of methods developed for analyzing complex perceptual-cognitive systems are discussed. For intensive

analytic methods to be applicable to the improved understanding of consumer behavior as well as to realistic marketing problems, it is important that the amount of information be maximized relative to the cost of obtaining it. The analysis methods developed for the present research should be suited to analyzing masses of data that may be viewed from many perspectives; moreover, these methods should be well suited to analyzing configural differences which may characterize a typological research strategy. Since the methods should be applicable in small sample research, the objective of maximizing utility may also be achieved.

CHAPTER II

A MODEL OF COMPLEX PERCEPTUAL-COGNITIVE PROCESSES AND A RESEARCH STRATEGY FOR TESTING THE MODEL

A Model of Complex Perceptual-Cognitive Processes

The model developed for this research is described mainly in terms of a single individual's representations for a single object. First, an overview of the model is presented. Second, the various components of the model are defined. Third, extensions of the model to situations involving more than one object and/or more than one person are defined. And, finally, comparisons of the model with the basic features of related models are considered.

Overview of the Model

Basically, this model is designed to describe what happens psychologically when a person becomes aware of an object. The general form of the model is one which is familiar in cognitive psychology. Figure 1 illustrates only the main characteristics of the model. Feedback loops and other complicating factors related to the origins of symbolic meanings are omitted for the sake of simplicity. At the left of the figure, the two major sorts of input to the system are represented--the perception of physical

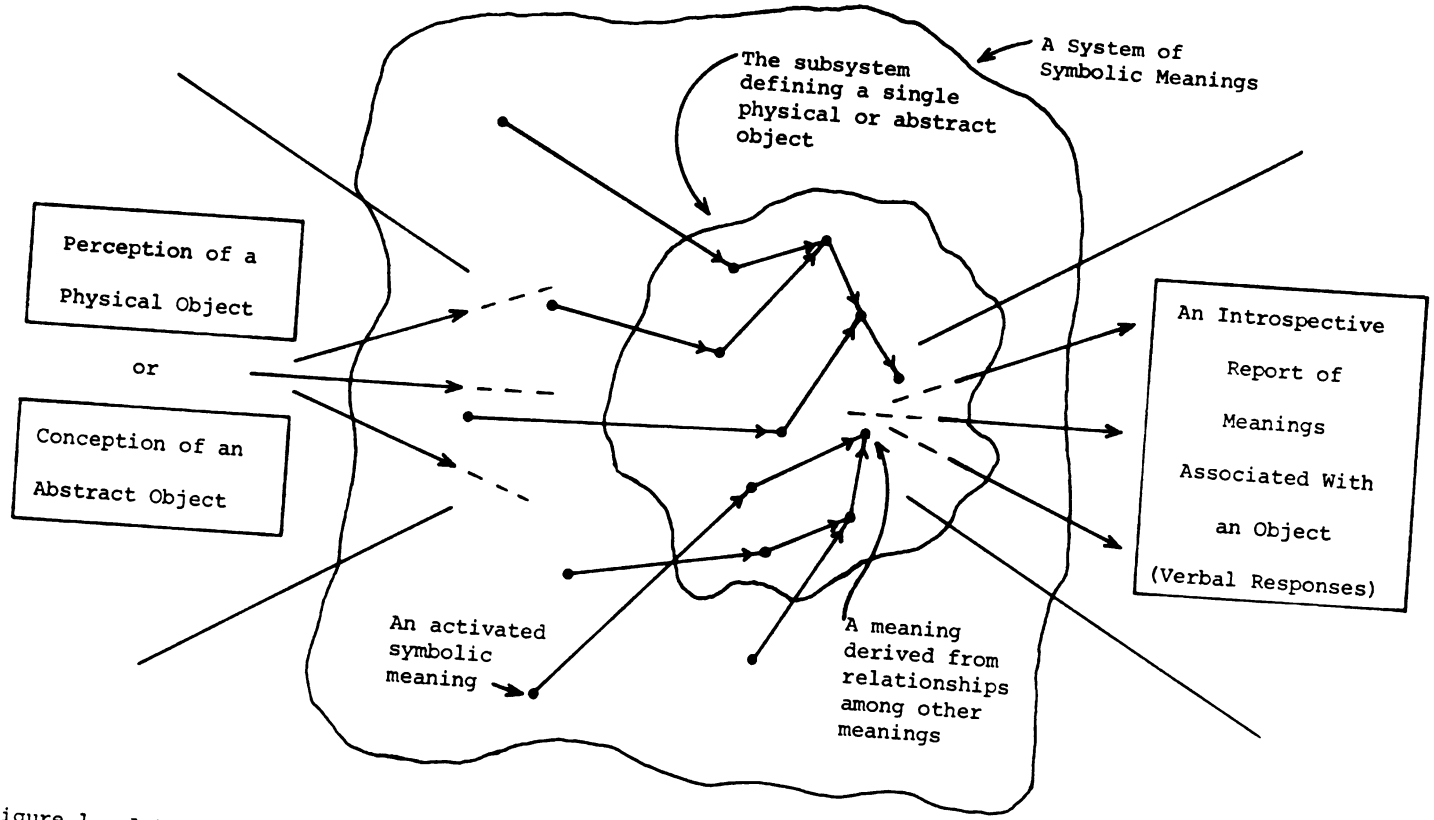

Figure 1. A Model of Complex Perceptual-Cognitive Processes.

objects and the conception of abstract objects. The center portion represents the broad system of symbolic meanings which includes one's cognitive definitions of various objects in the real world as well as one's self-definition, and the center of this region represents one's definition of the object perceived or conceived. The rightmost part of the figure represents verbal output from the system, verbal expression of the symbolic meanings defining the object that was perceived or conceived.

Essentially, Figure 1 illustrates that awareness of some physical or abstract object activates meanings within various portions of a broad system of symbolic meanings. These meanings are assumed to be activated because of previously established connections with characteristics of the object in question. Together, these meanings contribute to a person's definition of the object. Once formed, however, the definition should not be regarded as static. The meanings intitially activated are likely to undergo reorganization from time to time. Such reorganization may also lead to the synthesis of new symbolic meanings constituting an emergent by-product of relationships among other meanings.

While both verbal and nonverbal symbolic meanings are assumed to be among the meanings that define an object, it is also assumed that an introspective verbal report of meanings is reasonably representative of the total meaning-system. Although this procedure is admittedly incomplete, the expectation is that appropriate analyses of verbal meanings can uncover the major organizational characteristics of the underlying system.

Definitions

The definitions presented in the following sections develop the conceptual framework of the model. The first definition pertains to the basic units or "elements" (symbolic meanings) which define a single individual's perceptions of a single object. Since, in the model, each "element" is regarded as a subsystem in its own right, the second definition specifies the major characteristics of each symbolic meaning. Once the components of a single symbolic meaning have been described, it is possible to define relationships between symbolic meanings. Fourth and finally, the organization of meanings comprising a person's definition of an object is defined.

Elementary Cognitive Subsystems.--In the present model, each symbolic meaning is called an elementary cognitive subsystem, and these subsystems constitute the building blocks of the model.

Definition 1:

An elementary cognitive subsystem is a denotative or connotative meaning associated with either a physical or abstract object.

While an elementary cognitive subsystem constitutes the basic unit of analysis, this subsystem should not be regarded as irreducible. Instead, as the next definition points out, each elementary cognitive subsystem is regarded as having two major dimensions.

The definition given above is very similar to Fishbein's (1967a, 1967b, 1967c) definition of "beliefs about" an object. The Fishbein definition states that "beliefs about" an object are beliefs

in the existence of a relationship between an object and some attribute, goal, concept, or other object. A major difference between the definition given above and the Fishbein definition is that in the present approach inter-object relationships are excluded from the definition of an elementary cognitive subsystem. Since objects are assumed to be defined by a system of cognitive "elements," relationships between objects are regarded as complex matters to be handled through data analysis.

Components of Elementary Cognitive Subsystems.--Each elementary cognitive subsystem is regarded as having two major dimensions or components.

Definition 2:

An elementary cognitive subsystem has two major dimensions: (1) strength of association with an object, and (2) valence toward that association.

These two dimensions (or components) of an elementary cognitive subsystem may be represented by the axes of a two-dimensional subspace. Any particular symbolic meaning may be represented as a point in the subspace as shown in Figure 2. Although the two components are considered to be orthogonal, strength of association and evaluation of the association are viewed as interdependent psychological processes. Furthermore, while later research may reveal more appropriate units for the strength of association and valence dimensions, equal units are used for both scales as a first approximation.

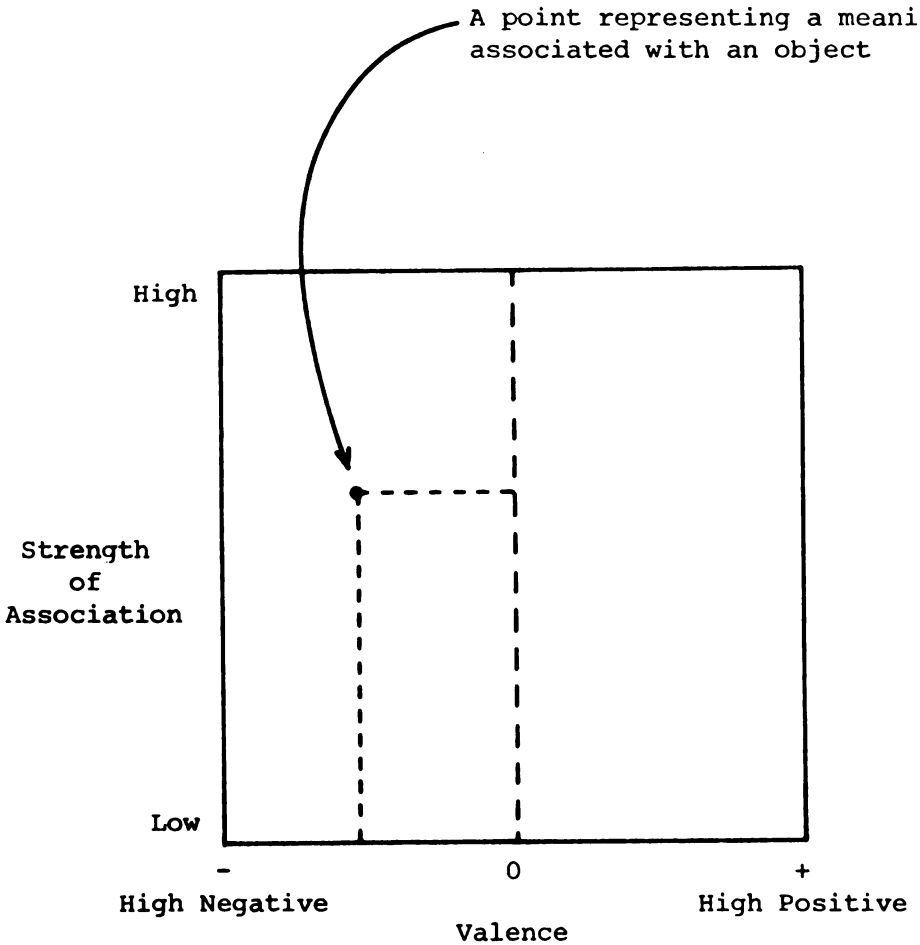

Figure 2. **A Spatial Representation of the Components of an Elementary Cognitive Subsystem.**

For many years now, cognitive theorists have regarded beliefs and attitudes as rather different psychological phenomena. The above definition attempts to reverse this situation by viewing attitude as a derivative of the evaluative (or valence) components of all the beliefs linked to some object (association strength).

The view expressed above is consistent with recent efforts to explore relationships between evaluative and non-evaluative responses to objects. For example, beliefs and attitudes have been described as having both affective and cognitive components (Fishbein, 1967b, 1967c; Krech, Crutchfield, and Ballachey, 1962; Rokeach, 1968) and Rokeach has theorized that these elements are interdependent and that they reinforce one another. Similarly, Osgood, et al. (1957) have obtained factorial evidence that every point in a semantic space has an evaluative (valence) component.

Relationships Among Elementary Cognitive Subsystems.--The preceding definitions establish the conditions which make it possible to calculate relationships among elementary cognitive subsystems.

Definition 3:

> The relationship between any two elementary cognitive subsystems is the Euclidean distance between the points representing the symbolic meanings under consideration.

To visualize how the relationship between two symbolic meanings may be measured, think of using the two-dimensional subspace described above to plot the points representing two different symbolic meanings.

The relationship between two meanings is simply the distance between the two points. This situation is illustrated in Figure 3.

Since the axes of the two-dimensional representation are identical for all symbolic meanings, the distance between any two meanings may be calculated in exactly the same manner. Moreover, matrices of relationships may be calculated for a large number of symbolic meanings.

Cognitive Object.--Given that the meanings associated with an object constitute an individual's definition of that object, the content and structure of these meanings may also be considered.

Definition 4:

A cognitive object is a complex constellation of elementary cognitive subsystems, where the relationships among elementary cognitive subsystems determine the organization of this constellation.

Whereas elementary cognitive subsystems specify the cognitive details of a perceived object, a cognitive object is the organization of these details and this organization may be quite complex. Although an elementary cognitive subsystem may be represented as a point in a simple two-dimensional subspace, the organization of a large number of points may be complex and nonlinear in form. For example, the system may be hierarchically organized as shown in Figure 4.

This conceptualization of the cognitive structure underlying a person's representations for an object is similar to the idea that an object may be viewed as a semantic space (Osgood, et al., 1957).

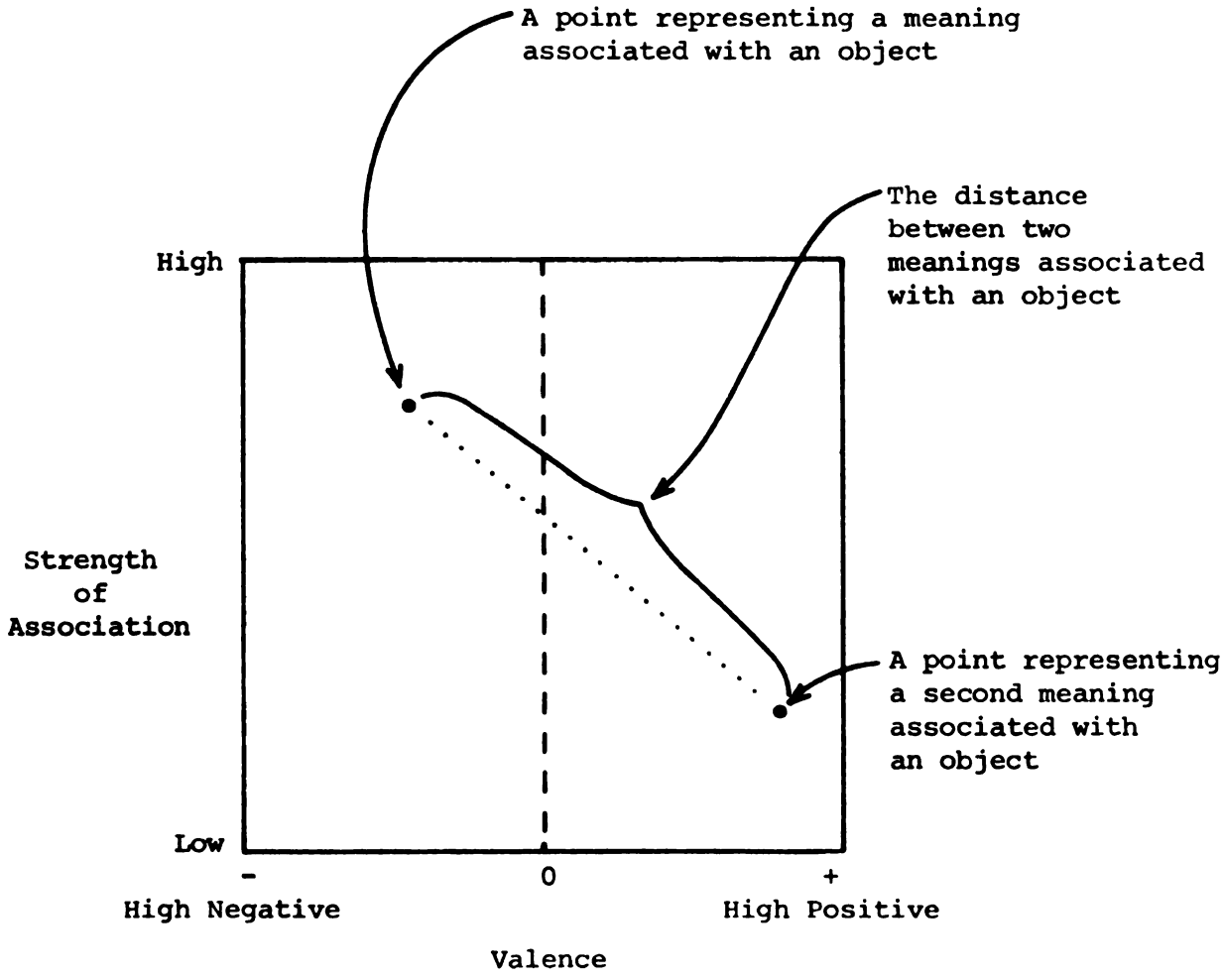

Figure 3. A Spatial Representation of the Relationship Between Two Meanings that are Associated with an Object.

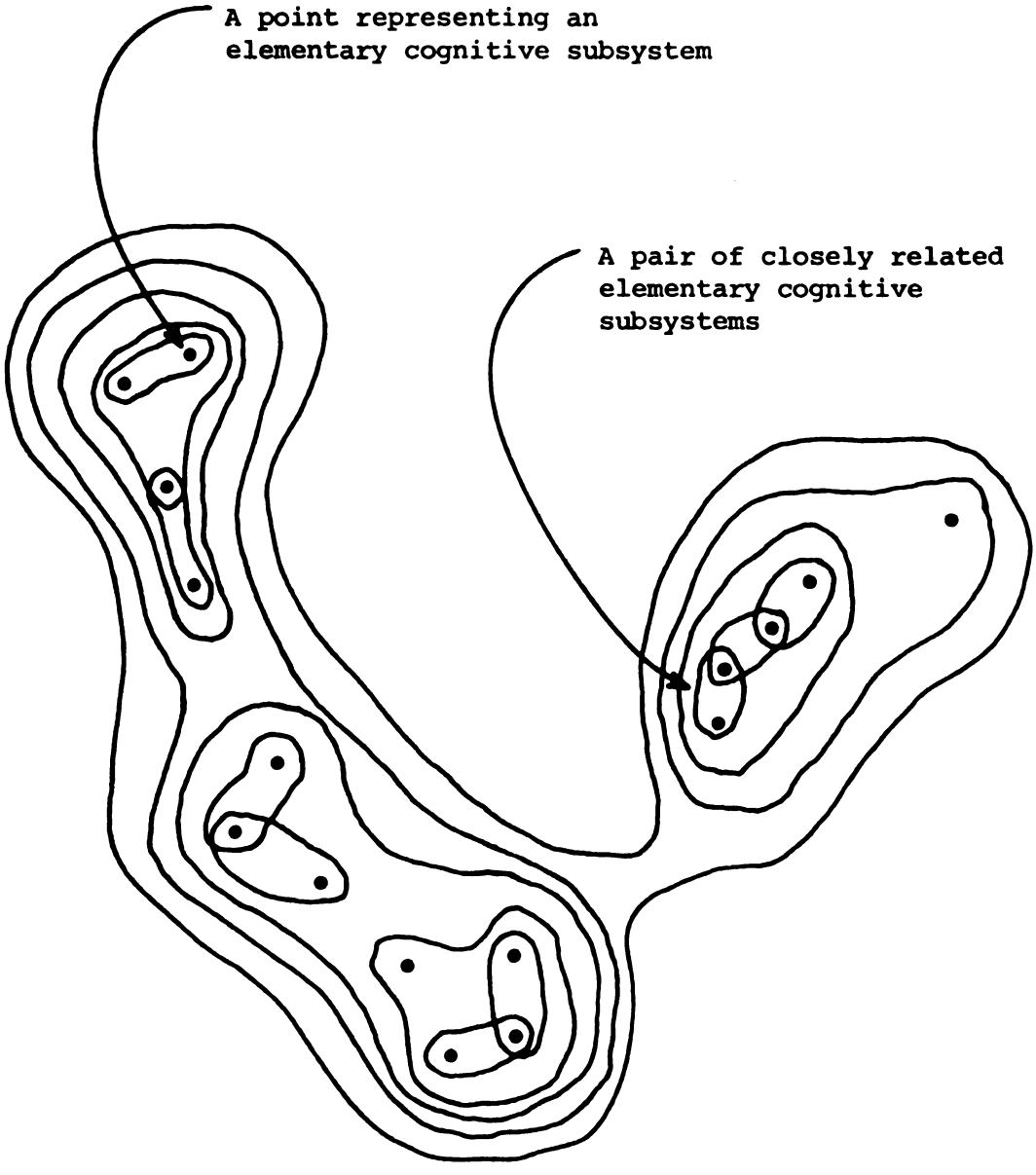

Figure 4. A Hierarchically Organized System Representing a Cognitive Object.

The main difference is that here it is unnecessary to restrict the space to a system of linear bipolar dimensions. Instead, the space may have nonlinear characteristics of various sorts.

The definition of a cognitive object is also related to the notion of a habit-family hierarchy as adapted from Hull by Fishbein (1967a). In this case, however, the model differs in that the "elements" of the hiearchy are elementary cognitive subsystems rather than beliefs.

Finally, the definition of a cognitive object has implications for the operationalization of several concepts used by Rokeach (1960, 1968). Specifically, Rokeach describes a belief-value system as a hierarchically organized structure wherein the cognitive elements (i.e., elementary cognitive subsystems as defined here) vary in centrality and connectedness, and the system as a whole varies in integration, differentiation, and other organizational properties. Assuming that the operationalizations of the present model are satisfactory, it may in turn be possible to operationalize methods for examining higher-order system characteristics such as integration, differentiation, and the like. To date, Rokeach has not devised operationalizations at the systems level.

Extensions of the Basic Model

Thus far the model has been described with respect to a single individual's reactions to a single object; however, the model may be readily extended to situations involving more than one object and/or more than one person.

A Cognitive System.--The first logical extension of the model concerns the representation of one person's responses to more than one object.

Definition 5:

A cognitive system is a constellation of cognitive objects.

Since the cognitive objects comprising a cognitive system are made up of elementary cognitive subsystems, the object systems should overlap to the extent that they have their origins in common or related experiences. A spatial representation of such a cognitive system is shown in Figure 5.

This definition of a cognitive system is crucial to the present research. It provides much of the rationale for seeking relationships between personality traits and consumer-product perceptions, since the cognitive processes associated with these two rather different classes of objects are viewed as possible parts of the same general system.

It should also be noted that relationships between objects are not specified by simple statements concerning some overall relationship between two objects as assumed in Fishbein's (1967a, 1967b, 1967c) definition of "beliefs about" an object. Rather, relationships between objects take into account the many specific relationships among the elementary cognitive subsystems defining each object.

Multiple Cognitive Systems.--The model may also be extended to include the meaning-systems (or cognitive systems) of more than one person.

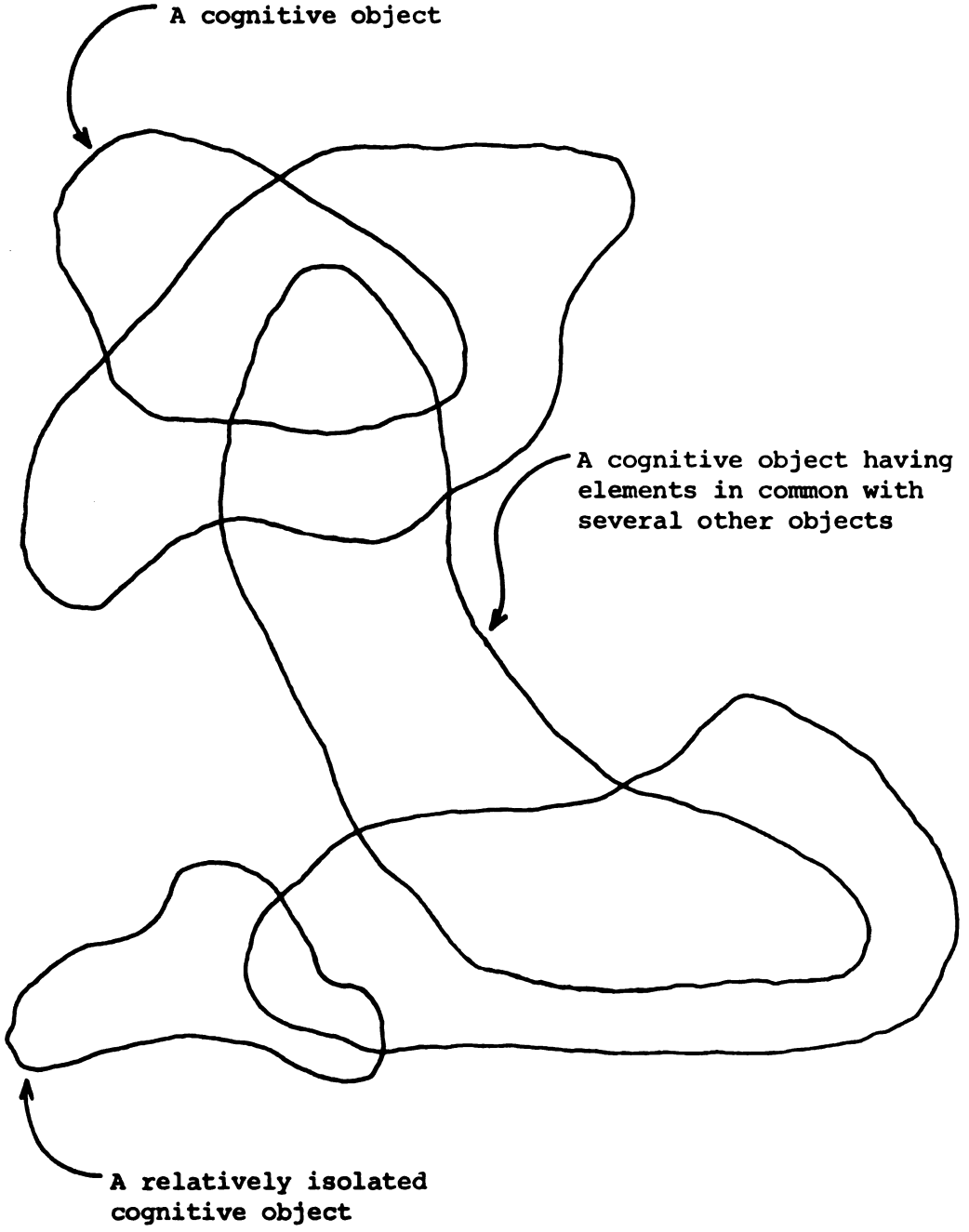

Figure 5. A Spatial Representation of a Cognitive System Including Several Cognitive Objects.

Definition 6:

A multiple cognitive system is a super-constellation of the cognitive systems for different individuals.

When several persons have responded to several objects in terms of a common set of verbal meanings, it is possible conceptually to "superimpose" the mappings of the several general cognitive systems involved. When this combining is done, the overlapping portions of different cognitive systems may be regarded as constituting inter-person commonalities[1] in perceptual-cognitive representations. If data for persons with similar viewpoints are analyzed on a composite basis, the commonalities should be substantial. Moreover, similarities in one perceptual-cognitive domain (e.g., personality traits) may be related to commonalities in other domains (e.g., consumer-product perceptions).

Comparisons With Other Models

Although the present model is related to existing psychological models at several levels, similarities and differences are most

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[1]The word "commonality" rather than the word "communality" has been used since it comes closer to reflecting the characteristics of definitions and operationalizations employed in the present research. Commonality may be defined as possession with another of certain attributes while communality may be defined as concordance or agreement in opinion throughout a group (see Webster's Third New International Dictionary, Merriam Company, Springfield, Massachusetts, 1963). Commonality was selected so there would be no confusion with factor analytic literature where communality implies something quite different from possession of common attributes. On the other hand, one should be careful to avoid confusion with another definition of commonality which refers to a body corporate or to common people.

easily examined in terms of the basic characteristics of each related model.

The following paragraphs describe the essential characteristics of elementary cognitive subsystems and compare these with what the writer views as the essential characteristics of consistency and balance models of cognitive structure and attitude organization.

According to the present model, elementary cognitive subsystems are symbolic meanings associated with objects. These subsystems may be described in terms of four characteristics: (1) content (symbolic meaning), (2) an object (physical or abstract), (3) a strength of association relationship, and (4) a valence attached to the perceived meaning-object relationship. While strength of association and valence are viewed as separate components, they are assumed to be interdependent psychological processes. Furthermore, the object being perceived or conceived helps to establish the context for particular meanings. To facilitate the comparison of elementary cognitive subsystems with the characteristics of other models, the subsystem has been represented as shown in Section a of Figure 6 rather than as the two-dimensional subspace described earlier.

A consistency model of cognitive structure may be described rather similarly. For example, the theories of Cartwright and Harary (1956), Heider (1946), and Newcomb (1953) may be described in terms of four characteristics: (1) symbolic meanings, (2) objects, (3) unit (U) relationships which are essentially strength of association relationships for particular meanings, and (4) liking (L) relationships

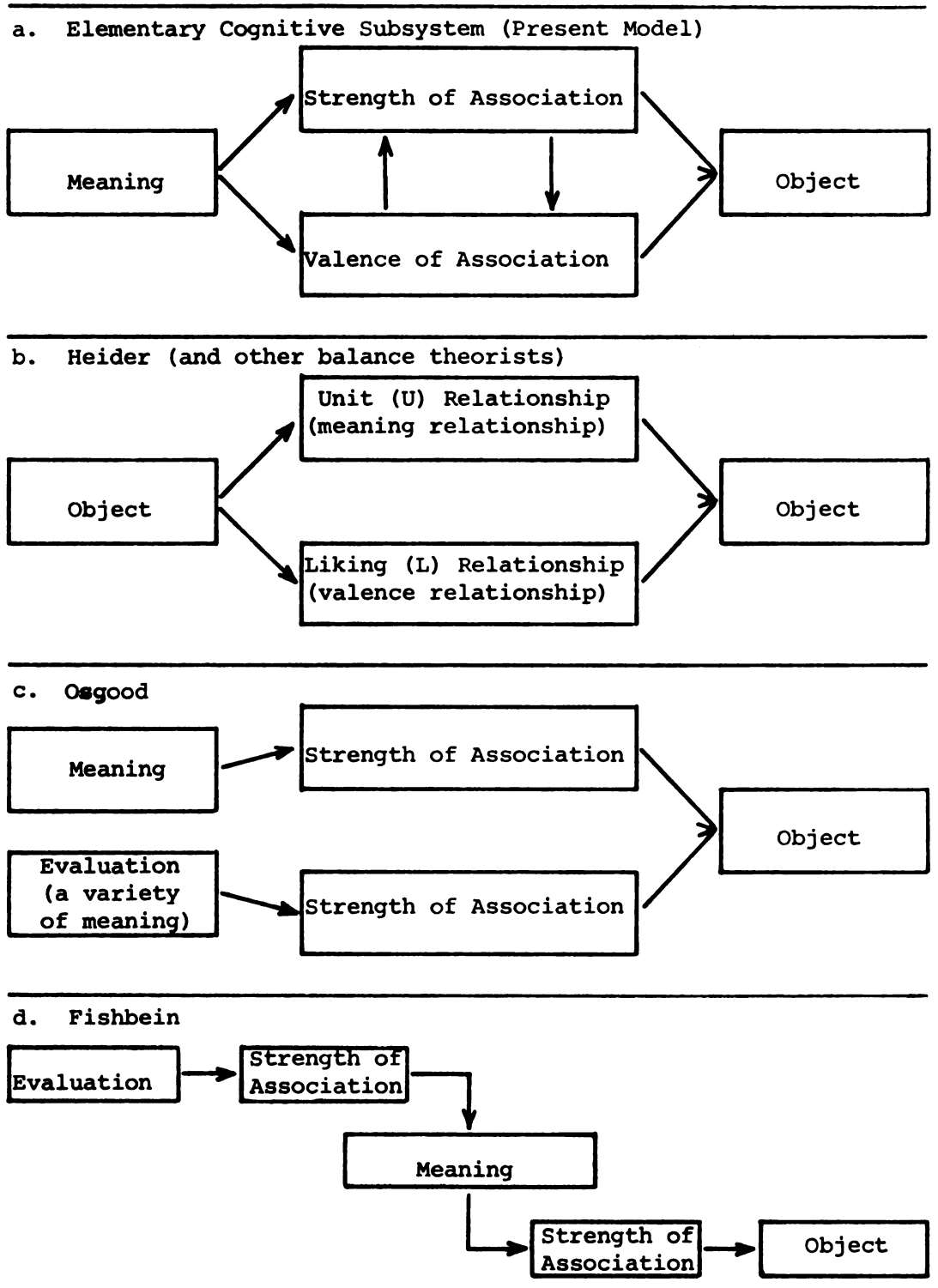

Figure 6. A Comparison of an Elementary Cognitive Subsystem with the Cognitive Units of Other Models.

which are essentially valence relationships. However, despite these similarities, there are some fundamental differences between such models and the present model. In the first place, the theories focus on object-object relationships rather than meaning-object relationships. Second, unit and liking relationships between objects are viewed as independent rather than interdependent psychological processes. Third, the liking relationship is concerned with the objects as a whole rather than with the affective significance of a particular meaning-object relationship. This situation is represented in Section b of Figure 6.

Behavioral models of cognitive structure and attitude formation, such as those developed by Osgood, et al. (1957) and Fishbein (1967a, 1967b), may also be described in terms of four characteristics: (1) symbolic meanings, (2) objects, (3) strength of association relationships, and (4) evaluation (or valence). However, the differences between such models and the present model are considerable. While Osgood has suggested that every meaning-object relationship has an evaluative component, both his model and operationalizations treat evaluation as a separate dimension of meaning (see Section c of Figure 6) rather than as a component of each dimension. Whereas Fishbein has recognized the importance of examining the evaluative aspect of an association with an object, he considers it possible to measure the evaluation of a belief (or meaning) independently of the association between a meaning and an object (this situation is represented in Section d of Figure 6). In other words, while Fishbein assumes a multiplicative relationship between a belief and its

evaluative significance, evaluative information is gathered outside the context of a meaning-object relationship. That is, the evaluative response is toward the meaning in abstract rather than toward a particular meaning-object relationship.

In summary, the advantages of the present conceptualization over the models described above are that: (1) only meaning-object relationships are considered, thereby avoiding oversimplification of inter-object relationships, (2) evaluation is viewed as a component of every meaning-object relationship, and (3) association strength and valence (evaluation) are viewed as interdependent processes which should be measured in the same meaning object context. Furthermore, since the present model possesses some of the characteristics of both balance and behavioral models, it may be regarded as an effort toward unifying these approaches.

A Strategy for Studying Complex Perceptual-Cognitive Systems and Comparison With Other Strategies

In order to test the model described in the preceding section, it was necessary to utilize some sort of psychological content. Two rather different sorts of content were purposely chosen for the research: (1) responses to several personality inventories, and (2) responses to a set of consumer products.

Personality inventories were selected as points of reference for examining relations between general cognitive characteristics and more specific perceptual characteristics. That is, traditional personality measures were assumed to be reasonably capable of mapping broad psychological characteristics.

Operationalizations of the model's constructs included the development of both data collection techniques and methods for mapping and comparing consumer-product perceptions. The methodology was believed to be freer of artificialities and methodological constraints than was the case with earlier methods. The data collection technique used to gather object perception data was an operationalization of an elementary cognitive subsystem. Furthermore, analysis methods constituted operationalizations of relationships among elementary cognitive subsystems, of the organization of cognitive systems, and of the organization of multiple cognitive systems.

The remainder of this chapter is divided into three main sections. The first section gives an overview of the present research strategy. The second describes general characteristics of the data collection techniques and compares them with existing techniques. The third section describes the general form of the analysis methods and compares them with existing methods.

Overview of the Research Strategy

For purposes of the present research, personality data were used in forming groups of persons. Each group was selected so as to be homogenous yet widely separated from every other group of persons. Each group was formed under the assumption that persons with similar personality characteristics represented a personality "type."

For each separate personality "type," the consumer-product perceptions of its members were then mapped. Some of these mappings dealt with typal commonalities in the content and organizational characteristics of consumer-product perceptions; others mapped

organizational characteristics of perceptions for the individual members of personality "types."

Once the mapping of consumer-product perceptions had been performed for separate "types," the results for contrasting "types" were compared. The content and organizational characteristics of these mappings were differentiated using a variety of methods. In each case, however, the purpose was to test hypotheses concerning relationships between personality characteristics and consumer-product perceptions. It was expected that these two rather different classes of cognitive phenomena would be related with respect to both content and organization.

In summary, much of the research strategy may be viewed as a mixture of what are described in factor-analytic literature as Q, R, and P techniques (Guilford, 1954). The main features of Q technique were represented in typological analyses of personality data. R technique was represented by cluster analyses of product-perception data for separate personality types, and the more intensive analyses of product-perception data for small groups and individuals corresponded to P technique. While the methods for differentiating between personality types fall outside this classification scheme, they have characteristics in common with such methods as discriminant analysis, automatic interaction detection, and several of Tryon's (Tryon and Bailey, 1970) typal differentiation methods.

While this investigation was limited to studying relationships between personality traits and consumer-product perceptions, the methodology may certainly be used with many other sorts of variables.

For example, relationships between sociological characteristics and product perceptions or relationships between physical contexts and person perception might be investigated in a similar manner. The possibilities are endless.

Data Collection

The techniques described below were used to collect data with which personality characteristics could be mapped, consumer-product perceptions could be mapped, and the perceptions of different types could be differentiated.

Techniques for Collecting Personality Data.--Several existing personality inventories were selected for the study. These inventories served as points of reference for testing the present model.

1. Assumptions.--A person's personality characteristics (or traits) were assumed to constitute abstract cognitive objects, where these objects were defined by sets of closely related elementary cognitive subsystems (see Definition 1, page 17). This assumption appeared reasonable in light of the fact that personality inventories are often constructed by means of item analysis which attempts to locate clusters of closely related items.

2. Varieties of personality measures used.--Both univariate and multivariate personality measures were used. The univariate measures focused on structural characteristics of one's personality (i.e., cognitive complexity and dogmatism). The multivariate measures focused on content features of personality (i.e., orientations to various social situations and personal values).

Techniques for Collecting Product-Perception Data.--Two techniques for collecting perceptual-cognitive data were used in this research. One pertained to overall evaluations of objects and the other pertained to detailed associations with objects. Since most of the analyses were based on data gathered with the latter technique, only this technique will be discussed here.

The technique for gathering detailed associations with consumer products was an effort to operationalize the concept of an elementary cognitive subsystem, and it was devised since existing techniques failed to provide an adequate operationalization of the concept. Data pertaining to the symbolic meanings that people associate with consumer-products (i.e., sterling silver tableware) were obtained by presenting respondents with a large number of attributes and several tableware patterns. For each pattern, Ss were asked to consider each attribute in turn and indicate: (1) the extent to which each attribute seemed to apply to the pattern (strength of association), and (2) the degree to which they liked or disliked this perceived association with the object (valence). Ss were also asked to think of attributes which contrasted with the ones presented and to react to these using the applicability and liking scales.

1. Assumptions.--A sterling silver tableware pattern was assumed to constitute a physical object which would be defined by a system of elementary cognitive subsystems. By gathering data on the elementary cognitive subsystems, it was thought to be possible to analyze the characteristics of the meaning-systems underlying a person's perceptions of this sort of consumer product.

2. Other characteristics of the main data collection technique.--The characteristics listed below helped to make the principal data collection technique rather unlike other techniques for collecting product-perception data:

a. Large amounts of perceptual-cognitive detail were collected.

b. Respondents were not asked to analyze or summarize their reactions but just to give first impression responses to the attributes presented.

c. The procedures were simple enough for Ss to react quickly.

d. The measurement procedures did not oversimplify perceptual-cognitive processes (i.e., while the task was the same for all attributes, Ss had considerable latitude regarding the attributes to which they responded and the form of the response).

e. Unnecessary linearity constraints were avoided.

f. The technique provided sufficient depth of information for investigating within-person phenomena.

Comparisons With Other Techniques for Gathering Perceptual-Cognitive Data.--While the personality inventories represented traditional approaches to collecting data on general characteristics of individuals, the technique for collecting detailed associations represented a considerable departure from other approaches to gathering masses of perceptual detail.

The fundamental differentiating characteristic of the present technique for collecting potentially complex perceptual-cognitive data was that associations with objects were viewed as joint functions of

association strength and valence responses obtained in the same meaning-object context. While a number of theorists have recognized the importance of measuring the evaluative significance of each association with an object, the present technique is unique in its operationalization of the idea (see Comparisons With Other Models, pp. 27-31). Moreover, measuring the evaluative significance of associations appears to facilitate the identification of complex, nonlinear differences among individuals and types.

Several commonly used approaches to collecting complex perceptual-cognitive data are discussed below.

1. Multidimensional scaling methods.--When psychometric methods are extended for use with perceptually complex stimuli, only rather vague global responses are obtained (Torgerson, 1958). As a result, sensitivity to potentially important individual differences may be prevented by the gross form of the responses given, and understanding of the behavior in question may be hindered by the absence of cognitive detail. In other words, such techniques impose severe constraints on the variety of information gathered and on the form of the responses.

2. Semantic Differential.--While a technique such as the Semantic Differential (Osgood, et al., 1957) allows respondents to express a variety of associated meanings, it requires them to make ratings along bipolar dimensions that are not necessarily perceived as opposites. Again, sensitivity to potentially important individual differences in an underlying cognitive system may be reduced.

While sensitivity to individual differences is increased in the Fishbein and Raven (1962) adaptation of the Semantic Differential for purposes of attitude measurement, a number of constraints remain. On the positive side, both belief strength and belief evaluation are measured. On the negative side, respondents are constrained to using bipolar response scales which may not allow them to express what they think.

3. McQuitty's approach to collecting detailed perceptual-cognitive data.--McQuitty, Abeles, and Clark (1970) have developed a technique which avoids bipolarity constraints as well as linearity constraints. Respondents were asked to express dichtomous responses for a rather large number of attributes, and the data were handled as nominal level information. However, what their technique may gain by relaxing the constraints of the Semantic Differential, it may lose in the fact that response scales are reduced to two choices.

4. Summary of other data collection techniques.--The three data collection techniques mentioned above have a number of disadvantages. These disadvantages include: (1) obtaining oversimplified (or global) responses, (2) forcing respondents to react to attributes in terms of bipolar dimensions, (3) failing to regard evaluation as an aspect of each association, and (4) severely restricting the range of responses. The data collection technique developed for the present study as an operationalization of elementary cognitive subsystems sought to overcome these disadvantages and simultaneously offer greater measurement flexibility.

Data Analyses

The analysis methods employed in this research were of three main types: (1) classificatory analyses of personality data, (2) mappings of the perceptual-cognitive systems underlying consumer-product perceptions, and (3) analyses of relationships between these two rather different domains of cognitive functioning. The first mode of analysis was concerned with establishing the conditions for typological analyses of differences among groups of persons. The second constituted the variety of ways that consumer-product perceptions were analyzed to reveal the content and organization of these perceptions. The third constituted the various ways that the impact of personality upon consumer-product perceptions was examined.

Classificatory Analyses of Personality Data.--The first step in testing the present model was to establish conditions favorable to revealing complex relationships between personality and consumer-product perceptions: that is, to perform the first type of analysis in order that the other two types might be performed. To establish such conditions, relatively small homogeneous groups of Ss were formed. Each group represented an empirically defined personality "type" which was maximally different from other "types" identified through use of the same personality measure.

The rationale for using small groups was as follows. While analyses for individuals may reveal configural response characteristics, results are not easily generalized. On the other hand, if large groups are studied, differences in kind are likely to be obscured and important information may thereby be lost. The present research seeks

to achieve a realistic balance between the specific and the general. By using small groups that are relatively homogeneous, the present approach attempts to remain sensitive to the perceptual-commonalities among the members of particular personality "types" while simultaneously obtaining results that may be generalized to these same types in a broader population.

For univariate personality measures, subgroups were formed by selecting the persons who scored highest and the persons who scored lowest on a particular measure. The subgroups were kept small so that within-group similarity would be high relative to between-group similarity, and group size was restricted to ten (a major consideration here was the expense of processing larger amounts of data).

For multivariate personality measures, the situation was more complex. In this situation, homogeneous subgroups were identified by cluster-analyzing interrelationships among the response profiles of the individuals in the total sample. The purpose of such analyses was to identify subgroups for which within-group similarity was high relative to between-group similarity.

1. Assumptions.--The ways in which the personality data were handled derive from two assumptions. First, people were assumed to differ in kind as well as in degree, and the meaning-system defining an object may, therefore, vary in many ways from one person or group to another. Second, some individuals were assumed to have enough in common that they may reasonably be classified as representatives of a particular viewpoint (or type).

2. A "type" as a statistical concept.--As employed here, the concept of a type is empirical and is tolerant of variation, rather than simply being a template which must be fitted perfectly. A definition of a pure "type" which may be extended to meet these conditions has been offered by McQuitty (1967). "In a statistical sense, a type is a category of persons wherein everyone is more like every other person in the category than he is like any person in any other category" (McQuitty, 1967, p. 23).

The above definition indicates that a type should be defined relative to the characteristics of the population under consideration. As long as subgroups are relatively homogeneous and are isolated from one another, the definition will be satisfied. The definition does not require that the members of types be virtually identical, provided that the conditions of the definition are satisfied.

What the definition does not take into account is the fact that all behavior has an error component. To the extent that inter-person distances include error components, it is inappropriate to employ an absolute definition of a "type." In other words, it would be desirable to use the definition as the ideal and develop indices reflecting the degree to which an absolute definition has been satisfied.

While the methodology of the present research does not include any formal tests of degree of fit, procedures used to identify personality "types" assumed that error components were a part of the data. The classificatory analyses simply sought the most homogeneous yet distinctly different groups of Ss. Furthermore, given this error

variance, it is likely that relationships found between personality and product perceptions will underestimate actual relationships.

Methods for Mapping Consumer-Product Perceptions.--Several methods for analyzing consumer-product perceptions were developed especially for this research because existing methods were not consistent with the characteristics of the present model. These new methods were concerned with the featured content of meaning-systems, with the response-style characteristics of perceptions, and with the structure of meaning-systems.

These three aspects of cognitive functioning were examined for two reasons: (1) much theory in the social sciences focuses on one or another of these levels of abstraction as a means of describing human behavior, and (2) most measurement techniques used in the social sciences focus on the content of responses, the manner in which responses are given, or the relationships among responses.

The content and response-style analyses were performed on group-composite data. Some of the structural analyses were also performed with group-composite data; others were performed separately for each individual.

While the formation of contrasting personality subgroups (or "types") may establish the conditions for studying perceptual-cognitive commonalities, the methods for analyzing consumer-product perceptions were entirely independent of the particular persons included in any given analysis. On the other hand, it should be pointed out that the same sorts of analyses were performed for each separate personality subgroup.

1. Assumptions.--The analyses of consumer-product perceptions were based on three main assumptions. First, it was assumed that people's responses have the characteristics of syndromes. Second, it was assumed that the meaning-system defining an object may be complex and nonlinear in form. Third, perceptual-cognitive commonalities among people were assumed to manifest themselves in the content and organizational characteristics of meaning-systems.

2. Content analyses.--The procedures for analyzing the content characteristics of perceptual-cognitive commonalities involved three steps. First, distance matrices of relationships among elementary cognitive subsystems (or symbolic meanings) were calculated for the system of symbolic meanings defining a multiple cognitive system (i.e., the perceptual responses of the members of a personality subgroup). The calculation of each relationship in a matrix was based on a summation across inter-attribute distances for all the objects to which each subgroup member responded.

Second, the distance matrix was cluster-analyzed with a hierarchical clustering method developed by the writer (Price, 1969). This clustering method was developed in an effort to avoid the several methodological difficulties inherent in McQuitty's pattern-analytic methods (refer to Cluster analyses, pp. 51-53), and it was used here to reveal the hierarchical organization of a multiple cognitive system. Third, the featured content of a system was identified. In other words, content clusters were identified for which within-cluster distances were low relative to the distances between these clusters and other parts of the meaning-system. The

approach was closely related to procedures used in pilot research exploring the use of other hierarchical methods for analyzing consumer-product perceptions (Price, 1968).

3. Response-style analyses.--Behavior at the level of separate elementary cognitive subsystems was studied by forming bivariate frequency-distributions for symbolic meanings. The data in the distribution for each symbolic meaning constituted the strength of association and valence responses that respondents within a particular personality subgroup expressed for each of several objects.

The distributions were summarized in two main ways: (1) by tallying the frequency with which content was associated with objects, and (2) by calculating a weighted average that summarized the joint distribution of association strength and valence responses.

Precedence for examining response characteristics derives from test development research and personality research. In the former, response sets or styles constitute troublesome biases. In personality research they are often measured as a means of differentiating among persons. The present typological approach also allows response sets to be measured as possible means of differentiation. Provided that within-group commonalities are reasonably high, the present approach may reveal response sets that differentiate between personality "types."

4. Structural analyses.--The organization of meaning-systems was analyzed in two main ways. The first approach entailed the use of factor analysis, and the second involved cluster analysis and a new

method for calculating the overall similarity of hierarchical systems (Price, 1970). Several sorts of matrices were analyzed in both instances.

Attribute by attribute matrices were formed for each of the subgroups yielded by the classificatory analyses of personality structure data. These matrices were formed as described in the section on content analyses. Additional attribute by attribute matrices were formed by separating responses to objects liked from responses to objects disliked and then calculating matrices for each subset of the data. In other words, two matrices were calculated for each personality subgroup (e.g., the two subgroups defined by the dogmatism variable). Similarity transformations of these matrices were then factor analyzed.

The clustering and structure-similarity analyses were likewise performed with some matrices based on responses to liked and disliked objects. In this case, however, these two sorts of matrices were formed for each individual in each subgroup yielded by a classificatory analysis of dogmatism data. After these matrices were cluster analyzed, the overall similarity of the two hierarchies was measured with the new method for evaluating structure similarity.

Methods of Differentiating Between Cognitive Mappings for Different Personality Types.--While analyses of the consumer-product perceptions for each separate personality subgroup may in fact reveal complex nonlinear characteristics, there remains the problem of determining the manner in which subgroup characteristics differ from one another. This problem of differentiating between subgroups

was handled by developing several methods for further analyzing and comparing the results of the previously described analyses. These methods are closely tied in with both the model of perceptual-cognitive processes and the data collection techniques developed for this research.

1. Assumptions.--The methods for differentiating between the consumer-product perceptions of contrasting personality subgroups were based on three assumptions. First, these two very different classes of phenomena were assumed to be related through meaning-systems underlying each class. Second, it was assumed that the relationships would be complex and nonlinear. Third, it was assumed that personality inventories concerned with content as well as those concerned with personality structure would have implications for both content and organization of consumer-product perceptions.

2. Content differentiations.--The featured content groupings yielded by each cluster analysis of consumer-product perception data were summarized as a content vector. The vector was formed by assigning a weighted average of association strength and valence responses to each featured attribute and then ordering the content from highest positive to highest negative weighted average.

The content vectors for contrasting personality subgroups were then compared in order to identify content that differentiated between these personality "types." To make this differentiation, a second pair of vectors was formed. These vectors represented the content that appeared in the first vector for one personality "type"

but did not appear with the same sign or by implication (a contrasting idea with opposite sign) in the first vector for the contrasting personality "type." To the extent that these differentiators revealed a unified viewpoint for each personality "type," they constituted a basis for interpretation.

3. Response-style differentiations.--Contrasting personality subgroups were also differentiated in terms of: (1) the frequency with which attributes and contrasting ideas were associated with sterling silver tableware patterns, and (2) the weighted averages for association strength and valence responses.

The frequency data were compared by simply counting the number of times that usage of an attribute or contrasting idea was greater for one of the personality subgroups. The weighted averages were used by counting the number of times: (1) a more extreme weighted average (absolute) was obtained by one subgroup, (2) a more positive (signed) weighted average was obtained, and (3) more extreme reactions were positive and extreme reactions were negative for one subgroup.

4. Structural differentiations.--The structural characteristics of consumer-product perceptions for contrasting personality "types" were differentiated by comparing the factor analysis results for these "types" and by comparing structure-similarity results for the individual members of these types.

Factor analysis results were compared by counting the number of times that an attribute and its contrasting idea had highest

loadings on the same factor. This approach was used for both the analyses of data based on summations across all objects and the separate analyses of responses to objects liked most versus objects liked least. Factor analysis results were also compared in terms of the proportion of variance accounted for and other indices.

The structure-similarity results were compared by examining the distributions of similarity indices for contrasting personality subgroups. Each value in the distributions represented the similarity of the meaning-system underlying the objects liked versus the system underlying the objects disliked.

Comparisons With Commonly Used Methods of Analyzing Complex Perceptual-Cognitive Data.--In this section, a number of other analysis methods are compared with methods developed for the present research. First, several classificatory methods are considered. Then, several methods for mapping relationships among variables are examined. Finally, a number of methods for differentiating between groups are discussed.

1. Other classificatory methods.--The methods used here to identify personality "types" bore a strong resemblance to some existing methods. Despite the general similarities, however, the present methods differed in some important ways.

a. Known-groups method.--The handling of univariate personality data bore some resemblance to the "known-groups" approach to test validation. As with the known-groups method, contrasting groups, or scission types (Stephenson, 1953, pp. 158-164), were identified from

a criterion variable and compared in terms of some other behavior (consumer-product perceptions). The main difference between the usual application of a known-groups method and the present analyses was that psychological information (personality data) rather than demographic, sociological, or political information was used to identify groups. Another difference, and a potential weakness, was that the criterion data was obtained from the persons being classified.

b. Typological analyses.--While the present handling of multivariate personality data was inspired by the Q-methodology of Stephenson (1953) and hierarchical clustering methods developed by McQuitty (e.g., 1959, 1960, 1961, 1963, 1966a, 1966b, 1966c, 1967) the intent of these analyses was quite different. Typically these other methods have been used to analyze a single body of data. That is, the data have been used to identify "types," and the "types" have then been compared in terms of the data configurations which defined them. In the present research, cluster-analyses of inter-person relationships were performed to identify "types" and the "types" were subsequently compared with respect to other behaviors.

The sorts of multivariate methods appropriate to identifying personality "types" are also appropriate for mapping cognitive systems. The relative merits of such methods will be examined in the next section. At this point, let it suffice to say that the McQuitty variety of clustering was used since it relaxes a variety of constraints imposed by other methods.

2. Other cognitive mapping methods.--Clinical psychologists, personality theorists, and others concerned with cognitive organization have given considerable attention to the concept of a syndrome (McQuitty, 1959) and to mappings of systems having nonlinear characteristics (e.g., the graph theoretic concepts of Cartwright and Harary, 1956). Some of the other analysis methods discussed here are suited to analyzing syndromes and systems; others are not well suited because of linearity, normality, and other constraints.

a. Correlation and agreement matrices.--Whereas the present analyses used mainly dissimilarity matrices, other research concerned with cognitive mapping typically employs similarity matrices of various sorts (e.g., correlation or agreement matrices).

When research is based on a diverse set of variables having different measurement scales, correlation is particularly useful. A correlation matrix reflects the patterns of differences between observations and controls for differences in magnitude. For the present research, however, measurement scales were constant for all object perception data, and the conceptualization of an elementary cognitive subsystems suggests that both pattern and magnitude should be taken into account (each meaning is a point in a two-dimensional subspace). The measurement of distance relationships can take these factors into account, and the two-dimensional subspaces are suited to such calculations.

Agreement matrices, such as those typically calculated for McQuitty's pattern-analytic methods, reflect pattern and magnitude under the constraint that only identical values in corresponding

observations are considered. As a result, agreement matrices are most appropriately calculated from nominal level data. If the data are continuous, pattern and magnitude are more sensitively measured with distance calculations.

b. Factor analyses.--While R- and P-type factor analyses have been employed for mapping complex systems, the linear model of factor analysis is incompatible with many aspects of the present model of complex perceptual-cognitive processes. For example, an elementary cognitive subsystem is defined as a two-dimensional subspace and a meaning is represented by the combination of intensity of association and valence components. Whereas distances between points in the subspace can be calculated, the form of the subspace is such that these distances cannot be translated into correlations. In addition, there is little reason to expect that a cognitive system can be parsimoniously described in terms of either an orthogonal or oblique axis system. To the extent that complex configurations define groupings of subspaces, factor analysis may obscure all but the most clearcut groupings and yield factors that account for rather little variance. Nevertheless, it remains possible that the mathematical power of factor analysis may have to be carefully balanced against losses in the ability to map certain varieties of relationships and against the necessity of imposing linearity, normality, and absence of interaction constraints.

c. Cluster analyses.--While a considerable variety of clustering methods has been developed in recent years, only a few

methods are sufficiently similar to those used in the present research to be discussed here. Some of these methods, e.g., key-cluster analysis and cluster structure analysis (Tryon and Bailey, 1970), have much the same intent as the present analyses yet they utilize factor analytic methods for reducing a space and therefore impose linearity and other constraints. On the other hand, methods which relax some of the constraints of factor analysis are generally less concerned with the problems of examining cluster structure. Included here are a matrix ordering method developed by Hunter (1968), an iterative method of Euclidean distance clustering (Tryon and Bailey, 1970), hierarchical clustering methods developed by Johnson (1967), and an entire array of hierarchical pattern-analysis methods developed by McQuitty and colleagues (e.g., McQuitty, 1959, 1960, 1961, 1963, 1966a, 1966b, 1966c, 1967; McQuitty, Price, and Clark, 1967; McQuitty and Clark, 1968; McQuitty, 1971; McQuitty and Frary, 1971).

While some of these methods relax parametric constraints, each has its drawbacks. For example, the Hunter method tends to yield only gross groupings of variables. The Tryon method of distance clustering tends to make complex relationships appear overly simple since overlapping groupings cannot be formed. The Johnson methods use matrix reduction procedures which can be shown to seriously distort many kinds of relationships in a matrix. Finally, many of the McQuitty methods employ matrix reduction procedures which are very similar to Johnson's techniques as well as procedures that emphasize hand calculation--considerations that are both unnecessary and unfortunate in this era of computers.

While the McQuitty variety of clustering seemed to seek objectives which were compatible with the complexity of the present model, the writer found it necessary to develop an alternative method of hierarchical clustering (Price, 1969). The advantages of the method developed for this research are threefold: (1) the method is oriented toward the use of computers and avoids restrictions which merely facilitate hand calculation, (2) the method works with the original matrix of relationships throughout an analysis and, thereby, avoids matrix reduction procedures which distort relationships, compound decision errors, or fail to take chance variation into account, and (3) by allowing for overlapping clusters, the method makes it possible to map relationships which cannot realistically be handled in a simple manner.

3. Other methods of differentiating between groups.--While there is a considerable variety of methods for differentiating between groups, rather few of these seem well suited to differentiating between groups which are defined by configurations, syndromes, or system characteristics. The methods described in Section A through G below represent some of the principal methods available for differentiating between groups. They are presented roughly in order of their ability to cope with complex systems.

a. Item analysis.--One of the simpler methods of differentiating between groups is item analysis (Gulliksen, 1950). The method determines the extent to which individual items predict the values of a criterion variable (in this case, a dichotomous variable

representing membership in contrasting personality subgroups). The predictive power of each item is examined separately from any other item's predictive power. The method assumes that item responses are linearly related to the criterion variable and that response distributions are normal. Prediction is best when items account for different portions of the variance in the criterion variable.

In contrast to item analysis, the present methods assume that personality types may differ in both degree and kind, that interactive combinations of items may have greater predictive power than linear combinations, and that linear constraints may obscure differences between groups.

b. Multiple regression.--When multiple regression methods are used to predict a dependent variable representing two different groups, the objectives are quite similar to those of item analysis. In both instances, the variables which best predict the dependent variable are identified (Walker and Lev, 1953). The main advantages over item analysis are that relationships among predictors are taken into account by determining the effect of each predictor with the effects of others partialed out and by determining weights for predictors which maximize prediction from a linear combination of predictor variables. That is, the method reveals the relative importance of different variables to the extent that linearity, additivity, normality, and absence of interaction constraints satisfactorily model the behavior in question.

Although multiple regression comes a step closer to the objective of examining the structure of a system, the constraints

are still quite severe. The underlying systems must not have configural characteristics, and groups must not differ in kind.

c. Discriminant analysis.--The present methods for differentiating between personality "types" also bear some resemblance to discriminant analysis (Cooley and Lohnes, 1962). In discriminant analysis, groups are treated as independent categories of a nominal level variable rather than as points along a continuum. The method facilitates group comparisons by determining weights for predictor variables such that each group's mean score is maximally different from every other group's mean score. The objective is accomplished by forming a pooled within-groups cross-products matrix of deviations of scores from group means and a between-groups cross-products matrix of deviations of group means from the total sample mean. Discriminant functions are computed as vectors associated with the latent roots of an equation for maximizing the ratio of between-group to within-group sums of squares.

Although the method makes it possible to differentiate among criterion categories (groups), both linearity and normality constraints are imposed by the factor analytic methods employed, and the discriminant function requires that group differences be satisfactorily modeled by a linear combination of several continuous variables. Again, the assumptions of linearity, normality, addivitivy, and absence of interaction restrict the method's usefulness with social science data.

d. Interaction detection.--Sonquist and Morgan (1964) have developed a method for identifying interactive combinations of variables that predict a criterion variable. The method may be used for differentiating between groups provided that the groups can be represented by a dichotomous dependent variable or as the values of an interval scale.

The method employs a nonsymmetric branching process to sequentially subdivide a sample into subgroups which maximize prediction of the values of the dependent variable. Analysis of variance techniques, rather than regression techniques, are used to identify predictors which provide the largest reduction in unexplained variance when used to subdivide a sample. Predictors may meet the conditions of either nominal or ordinal level measurement, and the final groups will consist of persons characterized by interactive combinations of values for the variables used in predicting subgroup membership.

While this method of detecting interaction effects avoids the assumptions of linearity, normality, and absence of interaction found in many other multivariate methods, the method has several drawbacks. First, since interactive combinations of predictors are built up sequentially, the proportion of error in the residual variance may increase with each split. Second, decisions to split a sample will be dominated by chance factors when different variables account for similar proportions of variance. Third, since a sample is split into a number of subsamples, the original sample must be quite large. If it is not large, only a few splits can be made. As a result, the

method is inappropriate for analyzing data from small groups or individuals.

e. Exact-pattern methods.--Exact-pattern methods for differentiating between groups have been developed by McQuitty and others. Unfortunately, McQuitty's methods have not constituted an improvement over linear methods (McQuitty, 1957), and other methods designed to handle configurations or syndromes have been shown to capitalize on chance occurrences of response patterns (Clark, 1968). In contrast to exact-pattern methods, the present methods differentiate groups in terms of "imperfect" patterns.

f. Criterion pattern-analysis.--A method which is related to the strategy of the present research was developed by Clark (1968). The method is called criterion pattern-analysis, and it bears a strong resemblance to discriminant analysis. The method involves searching for response configurations which characterize one group but not others. The objective of the technique is to search for the largest response configurations (or patterns) that differentiate among the groups. The acceptability of patterns is decided upon in terms of the frequency with which a pattern is more characteristic of one group than of others.

The advantages of criterion pattern-analysis are that: (1) the linear constraints of item analysis, multiple regression, discriminant analysis, and factor analysis are avoided, (2) interactive combinations of variables may be found to predict group membership, and (3) multiple or overlapping patterns of variables may differentiate among the various groups.

The disadvantages of criterion pattern-analysis are that: (1) the method tends to identify a large number of rather small patterns, (2) only discrete data with few categories may be used, and (3) the patterns may be difficult to replicate since they are absolute rather than probabilistic.

In contrast to criterion pattern-analysis, the present methods for differentiating among types: (1) may be applied with discrete or continuous data, (2) do not require absolute configurations, and (3) make it possible to examine the structure of relationships among patterns of meanings and thereby describe behavior in terms of system characteristics instead of simple response profiles.

g. Comparative dimensional analysis and comparative typological analysis.--Two methods, whose objectives are quite similar to the objectives of methods developed for the present research, have been developed by Tryon (Tryon and Bailey, 1970). These methods are called comparative dimensional analysis and comparative typological analysis. Although the methods are not entirely appropriate to the problems studied here, the basic approach is in keeping with the present methods for differentiating between groups.

Comparative dimensional analysis is of two sorts--subjective and objective. In the subjective form, inter-cluster correlations are calculated from the raw data defining the clusters of each group, and groups are then compared subjectively in terms of their patterns of intercorrelations. In the objective form, both within-group and between-group similarity indices are calculated from the factor

patterns that define clusters. The resulting similarity matrix is then submitted to key-cluster analysis.

In comparative typological analysis, the objective is to discover the degree to which object-types within different groups have the same structure. This is accomplished in two ways: (1) by examining the frequency with which the pattern of standard scores defining different subtypes of a group happen to occur, and (2) by direct comparison of z-score profiles for subtypes generated for each group.

While Tryon's methods are certainly in the spirit of methods used in the present research, they use different sorts of data from that gathered for the present research. Specifically, in Tryon's methods, scores rather than response vectors are the basic data, the methods are in some ways concerned with more detailed analysis of within-group organization, the results of separate analyses are described primarily in dimensional terms, and a number of parametric assumptions are required. Nevertheless, these methods are concerned with "types" and "subtypes," and the potentially configural character of groups characteristics is clearly recognized.

4. Summary of other differentiation methods.--While differentiation methods have been described roughly in order of their ability to handle complex systems, the full implications of this discussion can only be seen by summarizing the methods. Table 1 presents some of the major constraints imposed by these various methods as well as major capabilities of these methods. The methods

TABLE 1

Constraints and Capabilities of Several Methods for Differentiating Between Groups

Analysis Methods	Constraints					Capabilities				
	Linearity	Normality	Additivity	Absence of Interaction	Interval or Ratio Level Measurement	Variables Handled as a Potentially Nonlinear System	Group Characteristics Identified	Chance Variation Taken Into Account	Appropriate With Small Groups or Individuals	Significance Testing
Item Analysis	Y	Y	N.A.	Y	Y	N.A.	N	Y	N	Y
Multiple Regression	Y	Y	Y	Y	Y	N	N	Y	N	Y
Disciminant Analysis	Y	Y	Y	Y	Y	N	N	Y	N	Y
Comparative Dimensional Analysis / Comparative Typological Analysis	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
Interaction Detection	N	N	Y	N	N	Y	Y	Y	N	Y
Exact Pattern Methods / Criterion Pattern Analysis	N	N	N	N	N	Y	Y	N	Y	Y
Content Differentiations	N	N	N	N	N	Y	Y	Y	Y	Y
Response-Style Differentiations	N	N	N	N	N	N.A.	Y	Y	Y	Y
Structural Differentiations	N	N	N	N	N	Y	Y	Y	Y	Y

N.A. = not appropriate.

are arranged in order of the number of constraints that they impose. The methods developed for the present research are also included. Furthermore, it appears that the methods developed for the present research impose very few constraints yet have a very broad range of capabilities. Essentially, these methods seek to avoid constraints which distort relationships among variables or oversimplify the structure of a matrix and thereby yield unrealistic results.

From the table it may easily be seen that the constraints and capabilities of various methods differ rather sharply. It should be noted, however, that the listed capabilities of different methods tend to increase as constraints decrease. The most severely constrained methods have very limited capabilities and vice versa.

Since the data collection techniques developed for the present research appear useful for studying a wide variety of behavior, the apparent strength of the present analytic methods suggests that this combination of data collection and analysis methods can be extremely powerful tools for social scientists.

CHAPTER III

RESEARCH METHODS

While Chapter II describes the general strategy of this research, the present chapter describes the more technical aspects of how the strategy was implemented. Included in this chapter are discussions of subjects selected for the research, personality inventories and object perception instruments employed, the research design, randomization and other controls, data collection procedures, data preparation procedures, and data analysis methods. Instruments and analysis methods developed especially for this research are treated in detail.

In Chapter IV, prior to discussing the results for each method of differentiating between contrasting personality subgroups, the steps of the analyses performed will be briefly reviewed. For this reason, the reader who is interested in no more than an overview of the methodology may skip sections dealing with product selection, controls, preparing data for analysis, and details concerning the formation and analysis of attribute interassociation matrices.

Subjects

Undergraduates enrolled in several courses at Michigan State University during the spring of 1969 participated in this study.

The project was publicized as an Esthetic Preference Study, and students were asked to volunteer approximately three hours of their time. Participation was restricted to females, and usable data were obtained from 128 of the 129 Ss completing all parts of the study.

About 72 per cent of those who initially volunteered for the study were enrolled in Introduction Psychology classes offering some course credits for participation in research projects. Other students, who participated on a purely voluntary basis, were enrolled in sophomore level Psychology courses, a freshman level Home Economics course, and a freshman level Communications course.

Ss were scheduled for one session a week for three weeks. Of the 161 students who initially signed up for the study, 88 per cent (141) attended first-week sessions. Ninety-five per cent of the first-week Ss attended second-week sessions, and 96 per cent of these returned for the third part. Calculated in relation to the number of first-week participants, the loss of Ss from the first to the third week was just 9 per cent.

Considerable effort was devoted to reminding Ss of the times for which they were scheduled and to rescheduling Ss who failed to come to a session. In evaluating the participation figures, however, it should be noted that several Ss (about six) were dropped from the study because of rescheduling complications. Since different procedures were followed on different days and at different sessions during the same day, it was sometimes impossible to find a satisfactory rescheduling time.

With minor exceptions, only the data obtained from the 128 Ss completing all parts of the study were used in the major analyses. Furthermore, only one of the Ss who attended all three sessions had to be dropped from the study (a major mistake in the second-week procedures which was not noticed by the subject had made much of her data unusable). For Ss who participated all three weeks, nearly all data were complete. The potential problem of incomplete data was controlled by checking whether Ss had filled out everything and by keeping group tasks carefully coordinated.

Materials

All of the instructions, instruments, and apparatus used in the research are described in this section. Materials developed specifically for the study are discussed in detail and are included or pictured in Appendices A through G. Materials which are commercially available are described more briefly.

Preliminary Instructions

Three sorts of preliminary instructions were used. The three included a description of participation requirements, an introduction to the purposes of the study, and some general instructions which were appropriate to all parts of the study. These materials are found in Appendix A.

At the first-week sessions, all three preliminary instruction forms were used. At sessions during the second and third weeks, only the description of participation requirements and the general instructions were used.

Personality Inventories

The personality inventories used in this research were selected to represent several areas of cognitive and social functioning: the perception of role persons, the nature of belief-disbelief systems, orientations to social situations, and the content of value systems. The first two personality inventories are concerned mainly with the structure of cognitive systems. The latter two focus on the specific content of one's cognitions. The inventories not available through commercial sources are included in Appendix B.

Cognitive Complexity Index (Bieri).--The index of cognitive complexity used in this research was basically a form of the Role Construct Repertory Test (Kelly, 1955) with provided constructs. The original form of this scale was developed by Tripodi and Bieri (1964) and is described in detail by Bieri (1966). Bieri (1969) subsequently changed the format of the scale to simplify the task and control for order effects. The form used here was a minor modification of Bieri's revision designed to minimize other possible sources of ambiguity in the instructions and the arrangement of scales.

To score the scale, responses were put into a logical rather than a random order, and a "role persons" by "construct dimensions" matrix was formed. A S's score was calculated by comparing all pairs of ratings made by each "role person" and then counting the number of exact matches. This count was next divided by the number of comparisons for which neither response was missing (a modification of Bieri's method designed to handle missing data). Scores were inversely related to cognitive complexity.

A computer program was written to carry out the response reordering and score calculations.

Dogmatism Scale (Rokeach).--The dogmatism scale used in this research was a 20-item short-form developed by Trodahl and Powell (1965). With one exception, the items were not modified from their wording in Rokeach's 40-item version of the scale (Rokeach, 1960). The exception was an item appearing to have a strong sex bias (item 25 in the Rokeach scale). The wording of the item was changed from " . . . become a great man, like . . ." to " . . . become a great person, like . . ."

Since all items on this scale were stated so that agreement reflected dogmatic thinking, a S's score was the sum of the codes for positions along a 6-position Likert-type rating scale. The codes used ranged from 2 ("disagree very much") to 7 ("agree very much"). A neutral score for the 20-item scale was 20 x 4.5 or 90.

Adjustments for missing data were unnecessary since these data were complete, and scores were calculated by a computer program written for the purpose.

Orientation Inventory (Bass).--The Orientation Inventory (Ori) was developed by Bass (1967) to measure the impact of personality factors upon one's orientation to a variety of social situations. In particular, the instrument is based on the idea that there are three basic orientations to group situations--self-orientation, interaction-orientation, and task-orientation. That is, in any social situation, different individuals will be motivated by

different concerns and will attend to different content. These perceptual differences should, in turn, affect their social behavior. The instrument has its origins in the thinking of McClelland and Schacter, and in Bass's own efforts to develop an instrument which would be useful for predicting job-satisfaction, style of leadership, and job performance.

The instrument was scored as described in the manual for the scale (Bass, 1962). The scores for the three subscales (self, interaction, and task orientation) were then converted to T-scores using norms published in the manual. There were norms for female college students, primarily freshmen and sophomores, from various parts of the country.

Value Survey (Rokeach).--Form D of Rokeach's Value Survey (Rokeach, 1967) was used in this research. This version contains Terminal and Instrumental value subscales with 18 values each. Each value is printed on a gummed label and respondents rank order the values by moving the labels to the desired rank positions. Respondents are instructed to rank the values of each subscale from the one which is most important to the one which is least important to them.

As with the Orientation Inventory, the Value Survey was used because it focuses on content features of cognitive systems--content presumed to be central to one's belief system. While Rokeach (1968) has argued that matters of taste fall at the level of inconsequential beliefs, the present research seeks evidence of connections between values and the meaning-systems underlying consumer-product perceptions and hence can serve to check on Rokeach's assertion.

The Value Survey was not scored in a conventional manner. Instead, the configurations of ranks for different values were used as the data for other analyses.

Consumer-Products Selected for the Research

As mentioned in the preceding chapter, sterling silver tableware was the consumer-product selected for use in this research. Forks were borrowed from a single manufacturer. They included designs marketed by the particular company and its subsidiaries during the past 50 or 60 years. Such a broad range of years was chosen in order to represent the wide variety of motifs found on the market today, not simply the most popular styles of the present.

Rationale for Selecting Sterling Silver Tableware.--To test the present model of complex perceptual-cognitive processes, it was important to select a suitable class of products. High quality home furnishings appear to have characteristics which lead to a high probability of finding relationships between personality characteristics and the meaning-systems underlying product perceptions. Sterling silver tableware was selected as a representative of this class.

The characteristics of high quality home furnishing which appear to increase the probability of relationships with personality are listed below:

1. These products are sufficiently expensive that purchase decisions are likely to be carefully considered ("financial risk" is involved).

2. Quality furnishings are commonly used in relatively formal settings established for social interactions ("social risk" is involved).

3. Alternative products of the same type and quality differ mainly in physical appearance (styling differences are important).

4. Style characteristics of such products are commonly imbued with symbolic meaning by consumers, advertisers and designers. As a result, the symbolic associations with products may come to play an important part in development and maintenance of the consumer's self-image and in the presentation of a consumer to others.

5. There may be large individual differences in the perceptual-cognitive categories employed, depending upon differences in psychological and sociological histories. That is, for different sorts of persons there may be different sorts of relationships between personality and object perceptions.

Sterling silverware seemed a good choice for several additional reasons:

1. Silverware is sufficiently small that a rather large number of pieces may be conveniently used in a study.

2. There are a wide variety of styles having pieces of approximately the same size.

3. There are a wide variety of styles which do not utilize color. In other words, the absence of color controls for a potentially complicating factor.

Forks Selected for Object Evaluations.--Sixty forks were selected for a task in which Ss indicated how well they liked each design. The writer selected sixty forks from a field of about 200 by first sorting the forks according to their apparent elaborateness (see Appendix C for a list of the forks selected). An effort was made to keep in mind such criteria as object outline, bulk of decoration, and density of decoration, but the major criterion was simply the impression of overall degree of elaborateness. The sorted objects were then divided into six levels of elaborateness. Again, this categorizing was done on the basis of overall impression. Finally, 10 forks were selected from the variety of designs within each level.

Forks Selected for Object Descriptions.--Eighteen of the sixty forks used in the evaluations task were selected for a task in which Ss indicated what attributes they associated with each fork. The intent of this selection was to identify a wide variety of designs for which inter-person and intra-person evaluations of different designs could be expected to range from quite favorable to quite unfavorable (see Appendix C for a list of the forks selected).

The eighteen forks were selected on the basis of evaluative ratings obtained during the first week of the study. Frequency distribution analyses of these ratings were performed, and forks were

considered if their evaluative ratings covered a broad range of favorability and the distribution was fairly flat. The field of designs was narrowed to 30 on the basis of distribution statistics, and 18 forks which seemed to the writer to be reasonably representative of the full range of designs were selected for the Object Descriptions Task.

Object Evaluations Task

The sixty designs selected for this task were displayed in a random sequence on two large tables (see Appendix D). The sequence was determined with a random number generator on a computer, and the same sequence was employed throughout the study. The forks were displayed on six 11 by 27 inch sheets of flat-finish black cardboard. There were 10 forks per sheet of cardboard, and they were numbered sequentially. The forks were placed on the background cardboards with their tines toward the S and with the identifying numbers immediately ahead of the tines.

Instructions.--Ss were required to express their overall degree of like or dislike for each of the sixty forks using a ten-point scale that ranged from "dislike very much" to "like very much" (see Appendix D).

Rating procedures.--Ss marked their evaluative responses on specially printed machine-readable answer sheets. The numbers 1 through 60 were printed adjacent to rows of 10 mark-sense positions. Clipped to the top of each answer sheet was a printed template identifying the answer sheet columns corresponding to positions of

the rating-scale. On each S's answer sheet a starting number was circled. Ss were to begin their ratings with the fork of the same number and proceed in sequential order. Ss were assigned to one of six starting positions (1, 11, . . ., 51). After reaching object 60, Ss rated objects 1 to their starting number. Clipboards were provided to make the rating task more convenient.

Object Descriptions Task

The Object Descriptions Task was based on an operationalization of the fundamental cognitive unit of the present model (i.e., the concept of an elementary cognitive subsystem). The technique was originally inspired by research of McQuitty, Abeles, and Clark (1970) and an early form of the technique was used in research concerned with a few of the problems to which the present research was directed (McQuitty, Price, and Clark, 1967; Price, 1968).

The following discussion of different aspects of the Object Descriptions Task describes the task required of a single S. Minor variations necessitated by group-administration procedures are described in a later section.

The instructions, response forms, apparatus, task layout, and room arrangement for the Object Descriptions Task may be found in Appendix E.

Overview of the Object Descriptions Task.--For each of the 18 forks, a S's task was the same. A list of 36 attributes was presented to the S. For each attribute, she was asked to indicate: (1) the extent to which it seemed to apply to the object, and (2) the degree

to which the perceived association was liked or disliked. The S was then asked to think of an attribute or idea which contrasted with the one listed and then react to this content in terms of applicability and valence.

Ss rated the applicability of a characteristic along a five-point scale from "doesn't apply" to "extremely applicable." Degree of like or dislike for an observed characteristic of an object was rated along a five-point scale from "Dislike Considerably" to "Like Considerably." There were two degrees of positive and two degrees of negative affect plus a neutral position.

Ss were instructed to respond on the basis of first impressions, and they were free to respond to as many or to as few characteristics as seemed to apply.

Booklets of Attribute Lists.--Ss used booklets containing 18 lists of 36 attributes each. The same 36 attributes appeared on each page but in 18 different random orderings. For each new object, it was necessary to turn to the next list of attributes. The randomized lists of attributes were printed as computer output, cut to 8 1/2 x 11 inch size, and stapled together to form a booklet.

1. Identifying appropriate attributes.--The procedures used in identifying appropriate attributes for describing sterling silver tableware are discussed in Appendix E. In general, the attributes came from a variety of sources including: (1) research into the meaning structure of paintings (Osgood, et al., 1957, pp. 68-70), (2) a thesaurus search for likely adjectives, (3) vocabulary used in

books on the design of silverware and other home furnishings, (4) attributes suggested by designers and marketing researchers, (5) the writer's pilot research on words associated with silverware, and (6) a variety of other research concerned with the meaning-systems underlying the perception of physical or social objects.

Both denotative and connotative attributes were included among those selected, but a few constraints were imposed on the selection of attributes. In the first place, attributes which were seldom associated with silverware were screened out (some of the writer's own research findings were used to guide this part of the selection). Second, an effort was made to select attributes which did not seem highly evaluative. This was done in order to minimize the confounding of description and evaluation. And finally, the writer attempted to select attributes which could be interpreted as desirable traits by some Ss.

Object Sequences.--The 18 objects selected for this task were presented to Ss in three different randomized sequences. The sequence was changed every second session, and each sequence was used about the same amount during the study.

Apparatus and Response Forms.--Several materials were prepared to standardize the Object Descriptions Task, minimize procedural errors, and facilitate rapid response.

1. Object display board.--Each S was provided with a 6 3/4 by 11 inch piece of flat-finish black cardboard. This cardboard

provided a standard background on which Ss could place a fork while responding to it.

2. Response apparatus.--The main piece of apparatus constructed for the Object Descriptions Task was designed to facilitate rapid response rates and reduce procedural errors. The apparatus was constructed of cardboard and measured 14 inches by 14 inches. Machine-readable answer sheets were placed in the apparatus and were held steady by it. A summary of the questions to be answered was printed across the top of the apparatus. The various response categories were aligned with appropriate columns of the answer sheet.

The side of the apparatus was numbered from 1 to 36. These numbers were aligned with rows of an answer sheet and represented the 36 attributes on a page of the booklet of such lists. A sliding row-guide was also provided as a means of reducing errors in marking responses.

3. Answer sheets.--There was one answer sheet for each of the 18 forks. The answer sheets were IBM machine-readable multiple-choice forms which had been printed without number identifications for any of the mark-sense positions.

To make sure that Ss were using the correct answer sheet for each object, a number from 1 to 18 was written in the center of each answer sheet. Materials were arranged so that answer sheet number, attribute list number, and ordinal position of an object in the presentation sequence all corresponded.

A Comparison of the Object Descriptions Task and the Semantic Differential.--When the present research was in its initial planning stages, it was hoped that a Semantic Differential could be used for studying cognitive systems. However, after closely examining the Semantic Differential, the writer concluded that it had several drawbacks which could be avoided with a somewhat different instrument. The Object Description Task was developed as a first effort toward solving a variety of the problems inherent in the Semantic Differential.

The sorts of problems solved by the Object Description Task are explained by comparing the two approaches on several points.

1. The respondent task.--While both techniques ask Ss to use a rather large number of verbal symbols in expressing reactions to physical, social, or abstract objects, the rating tasks are rather different.

a. Semantic Differential.--Respondents are asked to express each reaction to an object by marking a position along a bipolar rating scale. The poles are constructed to be "semantic opposites" and the positions of the scale are mutually exclusive.

In using a Semantic Differential, the researcher must assume that: (1) all respondents view the polar adjectives as opposites, and (2) that polar adjectives may be realistically treated as the endpoints of a single dimension with mutually exclusive positions. That is, the technique cannot measure certain varieties of individual differences in cognitive habits.

b. Object Descriptions Task.--Respondents are asked to express each reaction to an object by rating the applicability of an attribute and the degree of like or dislike for a perceived association between attribute and object. Respondents are also asked to think of a word or idea which contrasts with the attribute given and make the same sorts of ratings. These latter ratings for contrasting ideas are made under the assumptions that: (1) there may be large individual differences in what is thought to contrast with a given attribute, and (2) contrasting ideas may be thought to apply even when the attribute paired with it applies (they may not be mutually exclusive).

Since Ss react to each attribute separately and are free to define contrasting ideas in accordance with the characteristics of their own perceptual systems, both of the assumptions made for the Semantic Differential are avoided. Furthermore, if Ss view given attributes as opposities or view contrasting ideas as opposites to provided attributes, the psychological distance between the attributes will be maximized and they will have responded as if ratings had been made on bipolar dimensions. This situation holds true regardless of whether other Ss respond in a similar fashion.

In sum, the Object Descriptions Task appears to be more flexible and more sensitive to complex cognitive phenomena and individual differences than is the Semantic Differential. At the same time, additional information is obtained in the form of like-dislike responses for each meaning-object association.

2. Construction and interpretation.--The two techniques are also quite different with regard to problems of constructing an instrument and interpreting results.

a. Semantic Differential.--The opposites used for bipolar response scales are defined empirically by obtaining large numbers of judgments. If judges are not in sufficient agreement about the opposites for given attributes, these attributes are eliminated from further consideration. To the extent that requiring low variability in the judgment of opposites tends to eliminate a non-random subsets of relevant content, the resulting instrument will not be representative of the meaning-systems it purports to measure.

The situation is complicated further by the fact that attributes perceived as semantic opposites in one context are not necessarily perceived that way in a different context. New instruments may need to be developed for different contexts.

An additional problem occurs because the Semantic Differential was designed to measure mainly the connotative meanings associated with objects. On the one hand, attributes most likely to yield high agreement in judgment of opposites are denotative rather than connotative. On the other hand, it is difficult for researchers to interpret responses unless the scales are highly connotative and these connotations are uniformly understood by most people. In other words, the researcher is on the horns of a dilemma. For example, if an object is described as "rough," it is impossible to know whether roughness is regarded as pleasant or unpleasant in this instance. If an object is described as "pleasant," it is impossible to know why

it is regarded as pleasant. In other words, the construction of the Semantic Differential conflicts with its objective of identifying relationships between sign, object, and person.

To the extent that content failing to meet the conditions described above is eliminated, the instrument becomes less representative of the relevant universe of content.

b. Object Description Task.--A list of attributes for use in an Object Descriptions Task may be assembled rather easily. Since Ss define their own contrasting ideas for listed attributes, the researcher only need concern himself with the extent to which the attributes selected are reasonably representative of the relevant universe of content. Attributes that are interpreted differently by different Ss or are interpreted differently in different contexts are not eliminated from the instrument. Similarly, attributes that lack well-defined semantic opposites need not be eliminated. In other words, the instrument does not depend upon normative commonality, and the objective of identifying a representative subset of the relevant universe of content may be sought without concern over individual or contextual differences.

The Object Descriptions Task also removes the constraint that content must have unambiguous connotations. Respondents are asked to express their degree of like or dislike for perceived attributes. This information: (1) helps a researcher interpret a response, (2) facilitates the use of predominantly denotative content, and (3) increases sensitivity to individual differences in perception. For example, an attribute such as "prestigeous" may receive identical

applicability ratings by several people, but there may be individual variation in evaluative ratings. Some may associate the attribute with desirable social aspirations and react positively while others may associate it with pretentiousness and react negatively. The evaluative ratings simplify interpretation. The researcher is, in part, relieved of attempting to infer what a respondent meant when the applicability response alone is ambiguous.

In removing some constraints and adding the assessment of evaluative reactions, the instrument becomes consistent with an assumption which led to its development. Specifically, it was assumed that the affective implications of both connotative and denotative attributes may differ depending on the perceiver and/or context. While the model presented in Chapter II assumes that strength of association and valence are related processes, the model also assumes that there are substantial intra-individual as well as inter-individual variations in perception. If this is true, then both the applicability and liking responses are needed to map a S's reactions to objects, and they are certainly needed for purposes of interpretation.

Support for this assumption derives from Osgood's own findings (Osgood, 1962, 1965; Osgood, et al., 1957; Osgood, et al., 1961) that most dimensions of meaning have substantial loadings on a general evaluative factor. It is also supported by Peabody's (1967) findings that the evaluative factor identified in studies using a Semantic Differential typically derives from the extremeness of descriptive judgments. Specifically, he found that the confounding

of description and evaluation tended to mask important dimensions of response to physical and social objects. When the effects of evaluation were controlled by constructing scales which minimize the confounding of description and evaluation, the major factors were descriptive rather than evaluative.

3. Other measurement characteristics.--The two techniques differ in several other aspects.

a. Semantic Differential.--In the use of the Semantic Differential, it is frequently difficult to determine the direction in which bipolar dimensions should be scored. The problem arises because both ends of a rating scale represent high intensity.

In addition, there is the problem that responses at the midpoint of the bipolar scales are open to several possible interpretations. Such responses may mean that the dimension is clearly irrelevant, that the respondent has a neutral feeling, or that the polar opposites apply in equal but unknown degree. The last of these interpretations is the most troublesome since a wide variety of individual differences can be hidden in such a response.

b. Object Descriptions Task.--For the Object Descriptions Task, the above-mentioned problems of scale reflection and response interpretation appear to be partially solved. Attributes are rated separately along an unipolar applicability scale, thereby allowing the same scale to be used for each attribute. If attributes are perceived to apply to an object, they are also rated on a bipolar valence scale which is the same for each attribute.

The scale reflection problem is eliminated because the same applicability and valence scales are used for each attribute. It would be difficult to justify reflecting one scale without reflecting all of them.

Word Associations Task

A word association task was administered to provide information which might be used in interpreting results (see Appendix F).

Instructions.--For each of 36 attributes, Ss were asked to think of words or phrases which seemed to contrast with them. The instructions pointed out that Ss need not be concerned with whether words or phrases seemed desirable or undesirable and that they should think of as many contrasting ideas as they could.

Ss worked from one of the randomized lists of 36 attributes used in the Object Descriptions Task.

Response sheet.--Each of two answer forms provided space for respones to 18 attributes. Within the space allocated to each attribute, there were lines for writing up to four contrasting ideas.

Background Information Questionnaire

The information gathered with a background information questionnaire (see Appendix G) was of three types: (1) general personal information such as age, year in college, and major; (2) information pertaining to parent's socio-economic status, and (3) some general information concerning a respondent's exposure to sterling silverware and likelihood of eventually purchasing silverware.

Data Collection Design

While many materials were used in this research and administration procedures were often rather complicated, the basic design of the data collection was quite straightforward. Essentially, a broad variety of data were collected from Ss in the course of three sessions conducted at approximately one-week intervals. The three different groups, to which Ss were assigned, were established to control for order effects, to facilitate collecting supplementary data, and to gather enough data during the first week to guide selection of forks for a task administered during the second week. The first two groups were the same except that materials presented in the first and third weeks were reversed. For purposes of analysis, these groups were treated as one. Data from the third group were not used in the main analyses. A schematic summary of the data collection design is shown in Figure 7.

From the figure it may be seen that the first two groups differed mainly in the fact that personality inventories administered during the first and third weeks were switched. The only exception to this was a background information questionnaire that was always administered at the end of the third session. For the analyses, data from these two groups were pooled.

The materials administered to Group 3 were somewhat different. The Object Evaluations Task was administered all three times, the Cognition Complexity Index was administered during the second week, and the Word Associations Task was administered during the third week. This group was used to obtain sufficient Object Evaluations Task data

Group	Week 1	Week 2	Week 3	
1	D.S. Ori V.S.	O.D.T.	C.C. O.E.T.	B.I.
2	C.C. O.E.T.	O.D.T.	D.S. Ori V.S.	B.I.
3	O.E.T.	C.C. O.E.T.	O.E.T. W.A.T.	B.I.

C.C. -- Cognitive Complexity Index

D.S. -- Dogmatism Scale

Ori -- Orientation Inventory

V.S. -- Value Survey

O.D.T. -- Object Descriptions Task

O.E.T. -- Object Evaluations Task

W.A.T. -- Word Associations Task

B.I. -- Background Information

Figure 7.--A Schematic Summary of the Data Collection Design.

to guide the selection of forks for the Object Descriptions Task. The group was also used to obtain data that might have proved useful had the present analyses failed.

To reduce some of the complexities of administering the study, all the sessions on a given day were generally handled as the same groups. That is, Ss were assigned to groups according to the day for which they had signed up.

Data Collection Controls

Data collection procedures included a variety of controls for order effects. Some of these controls necessitated rather complicated administration procedures.

Between Groups

One technique of controlling for order effects applied across the different weeks of the study. Groups 1 and 2 differed only in the fact that Week 1 and Week 3 materials were reversed.

Between Tasks

With the exception of the Preliminary Instructions for each session and the Background Information Questionnaire administered at the end of the entire study, the various tasks administered during a session were differently ordered for different Ss. The order of the tasks was simply rotated (or alternated).

Within Tasks

Several different controls for order or context effects were used with the Object Evaluations Task and the Object Descriptions Task.

Randomized Sequences of Objects.--The sixty forks selected for the Object Evaluations Task were displayed in a randomized sequence which was maintained throughout the study.

The 18 forks selected for the Object Descriptions Task were presented to Ss in three basic sequences. The sequence was changed every other session on a rotating basis.

Systematically Varied Starting Positions.--For the Object Evaluations Task, Ss were assigned to one of six possible starting positions in the sixty-object display. The starting points were forks number 1, 11, 21, 31, 41, and 51. They were assigned on a rotating basis.

For the Object Descriptions Task, a S's starting position in one of the basic object sequences was determined by her seating position in the group (see Group-Administration Procedures, pp. 88-91).

Randomized Sequences of Attributes.--The booklet of attribute lists used with the Object Descriptions Task contained 18 different random orderings of the same 36 attributes. Since there were three basic object sequences, a given ordering of attributes was associated with three different objects.

Data Collection Procedures

Most of the data for the study were collected in three weeks as specified in the data collection design. The only exceptions were a few individuals whose third session was rescheduled for the beginning of the fourth week.

Most of the data were collected during the first four days of each week devoted to the study. Six sessions were conducted daily. The first four sessions were scheduled at two hour and twenty minute intervals (a schedule which coordinated with class hours). The fifth and sixth sessions were scheduled at two hour intervals.

Research Setting

A rather large and evenly lighted room was used for the study. E scheduled the room for the entire three weeks of the study and was, therefore, able to leave all materials out between sessions.

The 2 1/2 ft. by 5 ft. tables in the room were arranged as shown in the diagram included in Appendix E. The numbered tables were ones at which Ss could work. Instruction and task materials to be handed to Ss were placed on Table B. The forks to which Ss responded in the Object Descriptions Task were collected on Table A. These forks were handed to Ss from Table C. The sixty forks used in the Object Evaluations Task were set out on Tables D and E.

Assistants

Six undergraduate students (2 male and 4 female) assisted with the administration of the study. No more than two assisted at any one session, and their jobs included putting materials in the proper orders for each session, handing out materials as Ss entered the room, answering simple procedural questions, calling Ss to remind them of upcoming sessions or to reschedule a session.

Group-Administration Procedures

While the materials used in the study were basically self-administered, Ss responded in two sorts of group contexts, self-paced and group-paced procedures.

Self-paced Procedures.--The materials and tasks administered to all groups in Week 1 and Week 3 and to Group 3 in Week 2 were self-paced. Each S worked at her own pace, and the physical presence of others imposed no apparent constraints upon performance.

As Ss entered the room used for the study, they were handed a packet including instruction and task materials (see Figure 7, p. 84, for lists of the task materials). Ss were instructed to sit wherever they wished and to begin work on the tasks after reading the instructions.

Ss were encouraged to ask E or one of his assistants to explain anything which seemed unclear. With the exception of questions about the Cognitive Complexity Index, most questions were about minor confusions. For this instrument, it was discovered that a minor misreading of instructions allowed Ss to follow a systematic but different answering procedure. Ss who followed this procedure were identified by means of a follow-up questionnaire item or by asking them which procedure they used as they were turning in finished materials. To compensate for the error, it was only necessary to reorder the responses. The same scoring procedure could then be used for all Ss.

Group-paced Procedures.--The manner in which the Object Descriptions Task was administered to Groups 1 and 2 during Week 2 may be described as "group-paced" since the Ss had to progress from one step to another as a group. That is, Ss had to adjust themselves to a common work pace.

Prior to each group session, E set out materials to be used by each S (Appendix E shows the general layout). The materials for each S included the preliminary instructions for the study, instructions for the Object Descriptions Task, a booklet of attribute lists, an object display board, a response apparatus, and answer sheets.

Each table used for the Object Descriptions Task was assigned a number (see Appendix E for a diagram of the room arrangement), and the materials placed at each table were coordinated with these numbers. For example, at table number 4, the booklet of attribute lists was opened to list number 4, and the answer sheets in the response apparatus were arranged in the order 4 to 18 followed by 1 to 3.

As a S entered the room for the session, she was assigned to a particular table. The first S was assigned to table number 1, the second to table 2, etc. As each S was seated, she was asked to read the general instructions and the instructions for the Object Descriptions Task (the number of Ss scheduled for a session ranged from 2 to 12 and averaged about 6).

When the scheduled time for the start of a session arrived, the door to the room was closed and no others were admitted (anyone who missed a session was promptly rescheduled). After all Ss had

read the Object Descriptions Task instructions, E summarized them for the group, answered any procedural questions, and stressed the need to work rapidly.

To begin the Object Descriptions Task, each S was handed one of the forks. The S at table number 1 was handed the fork in position number 1 of the object sequence used for that session. The S at table 2 was handed the fork from position 2 in the sequence, etc. In this way, attribute list number, answer-sheet number, and position in a particular object sequence were coordinated for each S in the group.

After all the Ss in a group had responded to a first object, they were asked to pass this fork to the person at the next lower-numbered seating position (the direction of passing was indicated on a card placed at the edge of each Ss table). E then handed the next object to the last S in the group and picked up the one to which the first S had responded. E reemphasized the need for first impression responses and suggested ways of reducing answer-marking time.

Before responding to a new object, it was necessary to turn to the next list of 36 attributes and remove the used answer sheet from the response apparatus (used answer sheets could be slid beneath the others). Because the numbered attribute lists and the numbered answer sheets were prearranged in the sequence appropriate for each seating position, the coordination of list and answer sheet numbers was quite automatic. However, Ss were asked to look for corresponding numbers in order to guard against accidentally skipping a list or answer sheet.

These procedures were repeated for each new object until all Ss had responded to all 18 objects. For example, the S seated at table 7 responded to objects 7 through 18 and then 1 through 6. While this scheme was adopted to make group-administration feasible and to avoid procedural errors, it also provided some control for order and fatigue effects.

Until Ss had familiarized themselves with the form of the questions and decided what words or ideas seemed to contrast with ones listed, the task proceeded slowly. While some individuals were initially impatient over having to wait for other group members, this impatience nevertheless facilitated a rapid increase in the response rates of the slower Ss. Moreover, most groups included at least one S who set a rapid pace. Consequently, by the time that 7 or 8 objects had been responded to, most Ss were responding near the 5 minute rate suggested in the instructions. Many Ss were able to mark their responses in as little as four minutes, and nearly all of these appeared to be concentrating on the task.

The Object Descriptions Task was usually completed in two hours. Each S gave about 30 applicability and 30 like-dislike responses per object (or about 1,000 responses for the 18 objects). At a rate of five minutes per object, a S had approximately ten seconds to decide whether an attribute (or contrasting idea) applied and to mark its perceived degree of applicability as well as the degree of like or dislike for the perceived association.

Preparing Data for Analysis

To facilitate both the administration of the study and the preparation of data for analysis, extensive use was made of machine-readable answer sheets.

Machine-Readable Forms

For the personality inventories, each S's responses were coded onto machine-readable forms by E or an assistant. For the Object Evaluations Task, special machine-readable answer forms were printed and Ss marked their answers directly on these. For the Object Evaluations Task, Ss again marked their answers on special machine-readable forms (this was particularly important here since approximately 100,000 responses had to be processed).

Punched cards were automatically prepared by passing the coding forms through an optical scanner, thereby greatly reducing the time and expense of card preparation.

Pre-Coding

Prior to the beginning of the study, all instruments, tasks, and answer forms were numbered so that packets of materials could easily be assembled in different orders (see Data Collection Design, pp. 83-85). These forms were then pre-coded with such information as experimental group number, week number, instrument number, and materials sequence number.

Post-Coding

The responses to several instruments were coded onto machine-readable forms by E or an assistant. The coding for the Cognitive

Complexity Index and the Dogmatism Scale was facilitated by the use of coding templates cut from manila file folders. The rows and columns for different items and responses were labeled on the folders.

For the Value Scale, coders used an ordered list of Values. Taking each listed Value in turn, a S's ranking of the Value was coded onto a machine-readable data sheet.

The machine-readable forms for all instruments were also coded with subject identification numbers so that the data could be coordinated for analysis.

Data-Editing

After the punched cards had been prepared, the data were edited. The editing was done both manually and with a variety of computer programs written to check for missing data and different sorts of response consistency.

Errors in coding or marking represented a rather small proportion of the total number examined, and many of these could be corrected. Types of errors which could be corrected included: (1) instances where coders omitted responses, and (2) lightly marked responses not picked up by the optical scanner. In the case of the Object Descriptions Task, the second category was rather easily identified by checking for response consistency. Since responses to this instrument were made in pairs, the elements of each pair had clearly specifiable relationships with one another.

Reordering Randomized Data

Since attribute lists and objects used in the Object Descriptions Task were presented to Ss in several randomized orders,

it was necessary to establish a common order before the data could be analyzed. The object sequence number and position in the sequence (same as the attribute list number) were used to add the actual object numbers to the pre-coding information for each S's data. A computer program was used to assign the numbers, and the data for each S were sorted by object number.

Classificatory Analyses of Personality Data

For each personality inventory, contrasting groups of Ss were identified as described below. Each group contained ten Ss, was relatively homogeneous with respect to the personality characteristics measured, and was as different from other groups as possible for the personality data available.

Cognitive Complexity Index

Two groups of extreme scorers were selected from the larger sample of 105 Ss. The ten Ss whose scores indicated Low Cognitive Complexity (the ten highest scores) and the ten Ss whose scores indicated High Cognitive Complexity (the ten lowest scores) were identified.

Dogmatism Scale

For this instrument, subgroups were identified in the same manner as above. Ss obtaining the ten highest Dogmatism scores and those obtaining the ten lowest Dogmatism scores were identified.

Orientation Inventory

Homogeneous subgroups of Ss were identified for the three subscales of this instrument according to the following criteria: (1) Ss classified as one of the three "orientation" types should score appreciable higher on one subscale than on either of the other two subscales, and (2) those classified as an "orientation" type should have similar configurations of scores for all three subscales.

Bass (1962) specified that Ss should score in the top quartile on a given subscale and below the median on the others before classifying them as members of a "type." Moreover, he indicated that about 80 per cent of Ss should be classifiable by this criterion. In the present study, however, fewer than 35 per cent of the Ss met Bass's criterion. As a result, it was necessary to relax his criterion and use the criteria described above.

The present criteria were applied by carrying out the following steps:

1. A dissimilarity matrix reflecting the separation of each S's configuration of subscale raw scores from every other S's configuration of scores was calculated. A computer program was written to perform the calculations, and the formula used was:

$$d_{ij} = \frac{\sum_{k=1}^{3}(a_{ik} - a_{jk})^2}{3}$$

where

d_{ij} = an index of the dissimilarity between Ss i and j

a_{ik} and a_{jk} = the score on kth subscale for Ss i and j respectively.

2. The resulting 105 by 105 dissimilarity matrix was then cluster analyzed by a method developed for this research (Price, 1969). A general description of the method is presented later.

3. Clusters of Ss, which were widely separated from one another in the hierarchical clustering results and were predominantly of one "orientation type," were identified. Within each cluster, ten Ss having the most in common were identified.

Value Survey

Two homogeneous subgroups of ten Ss each were identified for the Terminal Values scale and two were identified for the Instrumental Values scale. These subgroups were based on each individual S's configuration of ranks for the 18 values in a scale.

The procedures used to form the two subgroups for each Values scale were as follows:

1. S by S rank-order correlation (rho) matrices (Hays, 1963) were calculated for the Terminal Values scale and for the Instrumental Values scale (it was necessary to write a computer program to calculate rho for matrices of this size). A rank-order correlation matrix reflects the similarity of

each S's configuration of ranks to every other S's configuration of ranks.

2. The two 105 by 105 correlation matrices were then cluster analyzed with the method mentioned in the preceding section.

3. The resulting hierarchies of clusters were examined to identify subgroups for which within-group differences were small and between-group differences were large. Two subgroups of ten Ss were selected on the basis of the clustering results for each scale.

Methods for Mapping Consumer-Product Perceptions

This section describes the various methods for mapping cognitive systems that were developed especially for this research and is important for understanding Chapter IV. The methods described are concerned with: (1) the featured content of the meaning-systems underlying product perceptions, (2) the response-style characteristics of perceptions, and (3) the structure of meaning systems.

In order to perform the analyses of content and structure, it was first necessary to form matrices of interassociations among attributes (and contrasting ideas). The means by which such matrices were formed is discussed below.

Distance Matrices for Relationships Among Elementary Cognitive Subsystems

An important step in performing both the content and structural analyses was to calculate matrices reflecting distances among

attributes or contrasting ideas. To conceptualize how this was done, it is first necessary to describe the sort of data yielded by the Object Descriptions Task.

The data for the Object Descriptions Task may be represented as a data cube. Figure 8 represents a data cube for 18 objects, the 36 pairs of attributes and contrasting ideas, and the 105 Ss involved in the study.

Each chip of the data matrix corresponds to the two-dimensional representation of an elementary cognitive subsystem (see Figure 2). In terms of the response scales used for the Object Descriptions Task, an elementary cognitive subsystem may be represented as shown in Figure 9.

Coding Responses to Attributes.--With the exception of the three situations described below, responses to attributes were coded as shown in Figure 9:

1. If the responses for two attributes were erroneously coded in the same row of an answer sheet, both sets of responses were flagged as missing.

2. If an attribute was thought to apply in some degree but no valence response was given, a neutral response of zero was assumed.

3. If Ss failed to give applicability responses to attributes, the omission was assumed to be intentional. Such data were not flagged missing, since Ss were under a great deal of

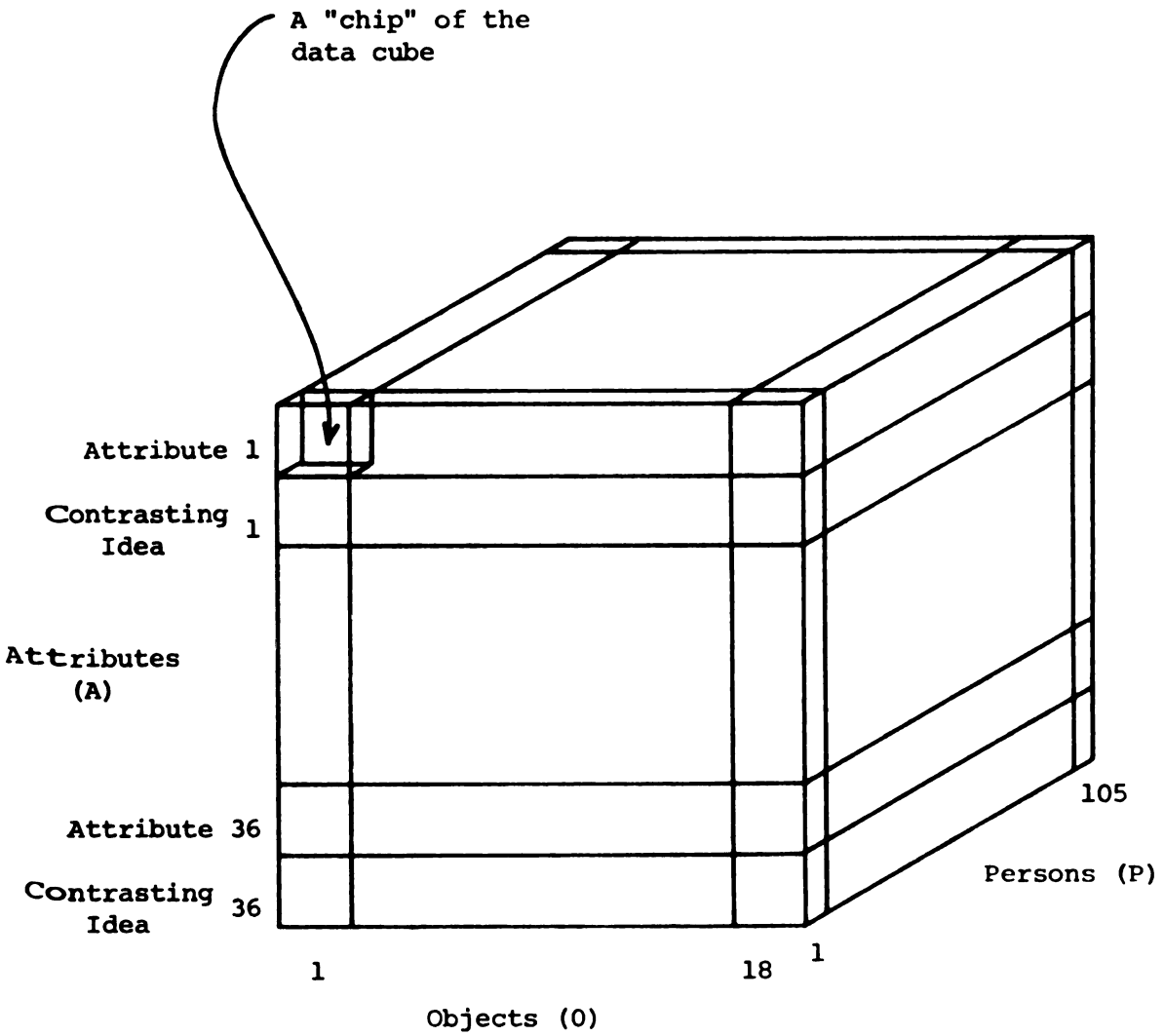

Figure 8. A Cube Representing Object Descriptions Task Data.

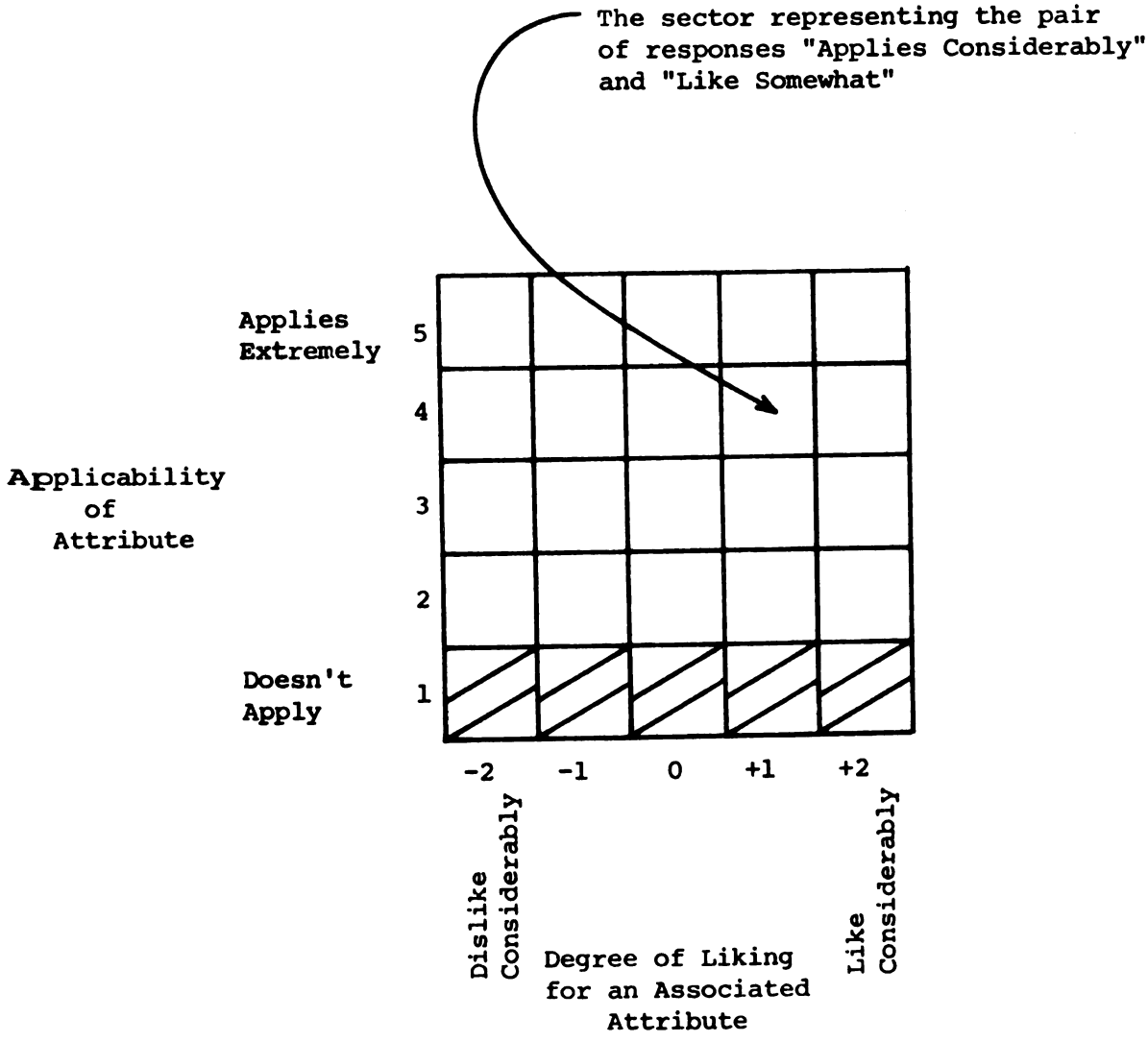

Figure 9. A Single "Chip" from the Object Descriptions Task Data Cube.

time pressure. They were told that "does not apply" ratings could be omitted to save time.

Distance Between Subsystems.--The distance between responses to any two elementary cognitive subsystems was calculated as described in the model of complex perceptual-cognitive systems (see Figures 2 and 9). This relationship may be expressed in terms of the following formula:

$$d_{(A_iO_jP_k,A_qO_rP_s)} = \sqrt{(a_{A_iO_jP_k} - a_{A_qO_rR_s})^2 + (l_{A_iO_jP_k} - l_{A_qO_rP_s})^2}$$

where:

d = the distance between two "chips" of the data cube

a = an applicability rating

l = a liking rating

A_i and A_q = attributes (or contrasting ideas)

O_j and O_r = objects

P_k and P_s = subjects

When calculating a relationship between the subsystems for two attributes (or contrasting ideas), the j and r subscripts for objects will be the same as will the k and s subscripts for respondents.

Two exceptions to the basic distance calculation must be noted. These apply to the handling of missing data and to other special circumstances:

1. When neither of two attributes was rated as applying to a particular object or when the data for at least one of the

two attributes was flagged as missing, the relationships between attributes was completely indeterminate for that object. Such data cells were excluded from calculations because it was impossible to know whether the attributes were far apart or where neither of two very close attributes were perceived as relevant to a given object.

2. When one attribute was rated as applying in some degree and a second was rated as not applying for a given object, distance calculations again entailed some indeterminancy, but there was a rationale for interpreting this situation as representing at least a moderately large psychological distance. In this case, a distance value of 6.0 (slightly larger than the maximum distance within the two-space of an elementary cognitive subsystem) was used rather than the smaller distance suggested by Figure 9.

Suppose, for example, a person responds that "rough" applies considerably and that "smooth" does not apply at all. Under these conditions the attributes could be far apart but at least they should not be regarded as very close. If they are close and one applies then the other should also apply. On the other hand, it remains possible that the attributes are not very far apart in one's psychological space. Consequently, it was assumed that, on the average, such situations would represent moderate distance (a distance of 6.0 was selected since it was slightly greater than the largest possible distance within an elementary cognitive subsystem). If

the distance of 6.0 should actually be an underestimate of some relationships, the effect would be to reduce the effectiveness of analyses seeking differentiations within one's cognitive system.

Matrices Calculated.--Since the present investigation yielded a considerable depth of information along each dimension of the cube, quite a variety of interassocation matrices could have been calculated from the data. Three basic types are possible--object by object matrices, attribute by attribute matrices, and person by person matrices. Within each type, there were also many possible variations.

Only attribute-by-attribute matrices were calculated for this research. Some of these were based on summations across all 18 objects while others were based on subsets of the 18, some were for groups of 10 Ss while others were for individuals, and some were for all 72 attributes and contrasting ideas while others were for only the 36 attributes presented to Ss.

The distance formula presented in the preceding section was used in the formula for calculating attribute-by-attribute matrices. The relationship between two attributes was summarized from one or more Ss' responses to one or more objects. Essentially, the relationships between any two attributes was defined as the average distance between corresponding elementary cognitive subsystems.

The general formula for the average distance between any two attributes (or objects, or persons) was:

$$\bar{d}_{x,y} = \frac{\sum_{1}^{n_{D_1}} \sum_{1}^{n_{D_2}} d_{(a_i O_j P_k, A_q O_r P_s)}}{n_{D_1} \cdot n_{D_2} - S}$$

where:

$\bar{d}_{x,y}$ = the average distance between a particular pair of attributes (or objects, or persons)

$d_{(A_i O_j P_k,\ A_q O_r P_s)}$ = the distance between two elementary cognitive subsystems

n_{D_1} and n_{D_2} = the number of elements selected for the summation from the other dimensions of the data cube.

$\Sigma\Sigma$ = a double summation over all pairwise combinations of corresponding elements selected from the other dimensions (exclusive of indeterminate or missing relationships).

S = the number of relationships skipped due to indeterminancy or missing data.

For example, the average distance between attributes 1 and 2 for objects 1 to 18 (n_{D_1} = 18) and persons 5 to 10 (n_{D_2} = 5) would be calculated as follows. Subscripts i and q would be fixed at 1 and 2 respectively. In addition, j and r would correspond for the summation across all 18 objects, and k and s would correspond for the summation across persons 5 to 10. Analogous restrictions apply for calculating entries in object by object or person by person matrices.

Further Comments on Distance Matrices.--The distance matrices were calculated from data with some unusual characteristics.

1. Absence of scores.--Since each elementary cognitive subsystem was represented by two values (a point in a two-dimensional subspace), the Object Descriptions Task could not be scored in any conventional manner.

2. No reflection problem.--Since the response to all attributes were expressed on identical scales, it would not make sense to reflect one scale without reflecting all of them.

Since the responses represented points in a two-dimensional subspace, responses were most easily summarized as inter-point relationships. Moreover, the absence of the reflection problem meant that one of the more troublesome problems in multivariate analysis was completely avoided.

Content Analyses

As mentioned in Chapter II, the content analyses for personality subgroups involved three steps: (1) calculating attribute interassociation matrices, (2) cluster-analyzing the matrices, and (3) identifying the featured clusters of attributes in the resulting hierarchical system of clusters.

Distance Matrices for Personality Subgroups.--First, an attribute-by-attribute matrix was calculated for each personality subgroup identified through the classificatory analyses. Each of these 72 by 72 matrices (the 36 listed attributes and the 36 subject-defined contrasting ideas) was based on a summation across the 10 Ss

in a personality subgroup and the 18 objects used in the Object Descriptions Task. In other words, the distance relationships reflected both within S and between S differences in perception.

Hierarchical Clustering Analysis.--The second step in the content analyses was to cluster analyze the distance matrix for each personality subgroup.

The clustering method used for this purpose was developed by the writer (Price, 1969) and is called Hierarchical Clustering by Largest Average Within-cluster Similarity (or L.A.W.S.). The method is closely related to ones developed by McQuitty (e.g., 1960, 1963, 1966a, 1966b, 1966c, 1967, 1971) in that successively more inclusive clusters are formed in an effort to represent the structure of matrix interrelationships.

Basically, the L.A.W.S. method constructs a hierarchy of clusters by: (1) identifying closely related pairs of attributes which do not have elements in common with other clusters (these constitute the nucleii from which larger clusters are constructed), (2) adding elements (in this case, attributes) to clusters already accepted, and (3) joining clusters that have been accepted.

The method is begun by ordering the distance relationships from low to high (coordinate identifications are kept with each distance value). After this, the procedure is to gradually work through the relationship values in order and make clustering decisions with each new value (or block of tied values).

At each level in an analysis the most closely related pairs of variables, which have not yet been processed, are compared with

clusters already accepted. A number of tentative clusters are formed on the basis of whether the variables in a pair are members of previously accepted clusters. A cluster is expanded if only one element of the pair is found in an existing cluster. Two clusters are joined if one element of a pair is found in one cluster and the other element is found in another cluster. These tentative clusters are then evaluated for acceptance into the final hierarchy.

Decisions regarding the acceptance or rejection of possible new clusters are based on the average similarity among the variables in tentative clusters. These averages are calculated from all pair-wise relationships among the variables in a cluster. The basic decision rule is that groupings with the largest average within-cluster similarity are accepted. In other words, the method seeks to keep within-cluster distances low and between-cluster distances high.

It is also important to note that this method may yield clusters that overlap to varying degrees. The amount of overlap is dependent upon the complexity of interrelationships in a matrix and the number of ties for a given relationship value.

The L.A.W.S. hierarchical clustering method was programmed by the writer for a CDC 6500 computer in order to make these analyses feasible.

Identifying Salient Content.--The intent of this followup analysis was to identify attribute clusters which were widely separated from one another in the attribute hierarchy yielded by a clustering analysis. That is, the attribute clusters selected for

further examination were the most isolated locations of relatively high attribute-density in a complex meaning-system (these same procedures were used to identify contrasting subgroups for the Value Survey and for the Orientation Inventory).

The criteria employed in selecting differentiated clusters of attributes were that: (1) there should be a minimum of three attributes (or contrasting ideas) in each cluster, (2) overlap among the clusters accepted should be minimal, (3) the largest and most tightly interassociated parts of each branch of the hierarchy should be accepted, and (4) the first 36 (or as near to 36 of the 72, as possible) attributes or contrasting ideas meeting the above criteria would be used as the salient content. These criteria were generally met by tracing the expansion of clusters up to the point where they contributed to the formation of a considerably larger cluster. The only exception to this rule arose in a few instances where there was one dominant and gradually expanding cluster. In this case, the size of the cluster selected was limited to about 10 until other nodes of the system had been extracted.

Response-Style Analyses

The data for each personality subgroup were also analyzed by examining the responses to each separate attribute (and contrasting idea). The particular methods used are described below.

Bivariate Frequency-distributions.--Since the responses to each attribute could be represented as shown in Figure 9, a 5 by 5 bivariate frequency table could be formed for each attribute.

Because of the masses of data used in forming such distributions, the author found it advantageous to write a computer program to tally the frequencies.

Summarizing Indices.--The bivariate frequency distributions were summarized by: (1) tallying the frequency with which Ss perceived content as applying to objects, and (2) calculating a weighted average that summarized the joint distribution of applicability and like-dislike responses.

The above-mentioned computer program was used to calculate these indices as described below.

1. Frequency of perceived applicability.--The frequency of perceived applicability was simply the number of times that 10 Ss in a subgroup indicated that an attribute applied to any of the 18 objects (180 possible applicability responses).

2. Weighted-affect scores.--The frequency tables were also summarized by calculating weighted-affect scores. These scores reflected one aspect of the relationship between perceived applicability and extremeness of positive or negative effect (the interdependence of association strength and valence) as manifested in the ratings of the Ss in particular personality subgroups. Specifically, the scores reflected the balance between positive and negative evaluation, and valence ratings associated with high applicability were given more weight than valence ratings linked with low applicability. Each score was based on a maximum of 180 responses (10 Ss times 18 objects). For weighted-affect scores to be large (positive or

negative), there must be a high degree of within-S and between-S consensus.

The weighted-affect score for an attribute (or contrasting idea) was calculated as follows:

$$W.A. = \frac{\sum_{a=2}^{a=5}\sum_{l=-2}^{l=+2}(a \cdot l \cdot f_{a,l})}{\sum_{a=2}^{a=5}\sum_{l=-2}^{l=+2} f_{a,l}} \cdot \frac{1}{a_{max} \cdot l_{max}}$$

W.A. = the weighted-affect score for an attribute.

a = the coded value of a position along the applicability scale.

l = the coded value of a position along the like-dislike scale.

$f_{a,l}$ = the frequency of responses for a particular combination of "a" and "l" ratings

a_{max} = maximum applicability code (5)

l_{max} = maximum positive liking code (+2)

All "doesn't apply" ratings (a = 1) were excluded from the calculations. Interest lay solely with those who perceived an attribute as applying in some degree.

The division by $a_{max} \cdot l_{max}$ was used to standardize weighted-affect scores to a -1 to +1 range.

Structural Analyses

As mentioned in Chapter II, two sorts of structural analyses were performed: (1) factor analyses of attribute matrices for personality subgroups, and (2) analyses of the similarity between different portions of the meaning-systems for individuals.

Structural analyses utilizing factor analysis were performed for the Cognitive Complexity and the Dogmatism subgroups since both of these inventories have implications for personality structure. In addition, cluster analyses and a new method for evaluating the overall similarity of hierarchical systems were used to analyze responses to objects liked and objects disliked. These analyses were performed for the Dogmatism subgroups since the theory underlying this personality inventory has implications for cognitive subsystems (i.e., belief and disbelief subsystems).

Dimensional Analyses of Structure.--Two main sorts of dimensional analyses were performed: (1) analyses of 72 by 72 attribute matrices based on summations over all 18 objects to which Ss had responded, and (2) analyses of 72 by 72 matrices based on summations across the 9 objects liked most by Ss as well as analyses of 72 by 72 matrices for the 9 objects liked least by Ss (Object Evaluations Task data were used to split each S's data).

The first sort of analysis was performed for both the Cognitive Complexity and Dogmatism subgroups. The analyses were performed with subgroups composed of the 10 lowest and 10 highest scoring Ss. As a check on stability, they were also performed with subgroups of the 20 lowest and 20 highest.

The analyses of separate 72 by 72 attribute matrices for liked and disliked objects were performed for only the 20-S Dogmatism subgroups. The 20-S subgroups were used to compensate for losses in stability which might have been produced by summing across the subsets of 9 rather than 18 objects.

1. Similarity transformations of attribute matrices.--Prior to factor analyzing attribute matrices, it was necessary to transform the distances to similarities. The formula used for this purpose was:

$$S_{ij} = \frac{3-\bar{d}_{ij}}{3}$$

where:

S_{ij} = the similarity of attributes i and j

$\bar{d}_{ij}$ = the average distance between attributes i and j

Although this index ranges from -1 to +1, it is not identical to a correlation coefficient. On the other hand, the values do have an interpretation which is similar to correlation. For example, an index near +1 means that most Ss in a subgroup gave similar ratings to attributes i and j for most objects. Correspondingly, a value near -1 means that, for most objects, most Ss in a subgroup rated one attribute as applying in some degree and the other as not applying. Finally, a value near 0 means that, on the average, the responses to two attributes had a medium degree of separation in the two-dimensional subspaces representing elementary cognitive subsystems.

2. Factor analyses.--The four 72 by 72 similarity matrices formed for Cognitive Complexity subgroups were factor analyzed (2 matrices based on summations across all 18 objects for 10 Ss and 2 based on summations across all 18 objects for 20 Ss). Similarly, the eight 72 by 72 matrices calculated for Dogmatism subgroups were factor analyzed (2 matrices based on summations across all 18 objects for 10 Ss and 2 for summations across all 18 objects for 20 Ss, 2 based on the responses of 20 Ss to the 9 objects liked most, and 2 based on 20 S's responses to the 9 objects liked least).

In each case, a 10-factor varimax solution (Harman, 1967; Price and Ingvaldson, 1972) was calculated. Unities were used in the diagonal of these similarity matrices. The similarity matrices for objects liked and objects disliked were factor analyzed by performing 9 separate varimax rotations with 2 through 10 factors.

Clustering Analyses of Structure.--The clustering analysis of structure were performed for only the Dogmatism subgroups and the analyses involved three steps. First, two separate 36 by 36 attribute matrices were formed for each individual in a subgroup (one matrix for the 9 objects liked most and another matrix for the 9 objects liked least). Second, each distance matrix was cluster analyzed using the method described earlier. And third, the similarity of the clustering results for liked and disliked objects was evaluated on an individual by individual basis using a method developed by the writer.

1. Distance matrices for individuals.--Object Evaluations Task data were used to identify the 9 objects liked most and the 9 liked least by each S in the 10-S Dogmatism subgroups. Two 36 by 36 attribute matrices were formed for each individual by summing across the specified 9 objects in each case.

2. Hierarchical cluster analyses.--The 20 pairs of distance matrices yielded by the procedures described above were analyzed using the L.A.W.S. hierarchical clustering method (Price, 1969).

The analyses were restricted to 36 by 36 matrices largely because of the expense of performing 40 separate analyses of large matrices.

3. Structure-similarity analyses.--A method for objectively comparing the results of two hierarchical clustering analyses was developed by the writer (Price, 1970) and programmed for use on a computer.

The method is based on the idea that the similarity of two hierarchies may be measured in terms of the degree of correspondence between individual clusters in the two hierarchies. More specifically, the idea is that cluster similarity indices may be derived from: (1) the number of elements (attributes) in common to clusters in different hierarchies, and (2) the sizes of the clusters being compared. The similarity between a cluster of one structure and a cluster of another is expressed as a size ratio. The ratio is the size of the cluster portion common to two clusters in different hierarchies divided by the size of the larger of these clusters.

Essentially, the method consists of taking each cluster of both structures in turn and finding the cluster of the other structure which yields the largest size ratio. The ratio may be interpreted as the percentage of correspondence in clustering (the ratio equals 1 when identical clusters are found in two hierarchies).

The indices of cluster similarity are combined to form an index of structure similarity. A weighted average is calculated, where the weight for each cluster ratio is the size of the cluster portion in common at the point of greatest observed correspondence. The denominator for this average is the sum of the cluster portions that are common to clusters at points of largest observed ratio. The resulting similarity index ranges from 0.0 to 1.0 and may be interpreted as an average percentage of cluster correspondence between the results of two hierarchical clustering analyses. A value of 0.0 indicates no correspondence in clustering and 1.0 indicates that two structures are identical.

The rationale for weighting the average directly, rather than inversely, derives from the idea that low-level clusters are "imperfect" typal representatives and that the larger clusters in a hierarchy are more important (McQuitty, 1959, 1967). That is, the directly weighted average regards high correspondence between major clusters as more important than high correspondence between minor clusters.

Methods for Differentiating Between Cognitive Maps for Different Personality Types

Contrasting personality types were differentiated in several different ways. In each case, however, results from the separate

analyses of personality subgroups were used as the data for these subgroup differentiations.

Content Differentiations

The results of content analyses of Object Descriptions Task data were used in comparing contrasting personality subgroups.

The procedures used to summarize results to the point where subgroups could be differentiated were as follows:

1. Each attribute or contrasting idea, in the list of salient content for a personality subgroup, was assigned a weighted-affect score calculated in the response-style analyses.
2. Content that appeared in the list of salient content for both subgroups was eliminated if the sign of the weighted-affect scores was the same. Similarly, attributes and contrasting ideas with opposite valence were eliminated under the assumption that the two implied roughly the same thing.
3. The remaining content was ordered from highest positive to highest negative weighted-affect score.
4. Contrasting personality subgroups were then compared in terms of the differentiating content. As with factor analyses, the interpretation of these content results was subjective.

Response-Style Differentiations

The summarizing indices calculated from the bivariate frequency distributions for individual attributes were used to compare personality subgroups.

Contrasting subgroups were compared in terms of frequency of usage information. A count was made of the number of attributes and contrasting ideas that were more frequently rated as applying by one subgroup than by the other groups.

Contrasting subgroups were also compared in terms of weighted-affect scores. Counts were made of the times that one subgroup obtained: (1) more extreme weighted-affect scores (compared in terms of absolute value), (2) more positive valence (signed value), and (3) more extreme scores that were positive versus more extreme scores that were negative.

The statistical significance of subgroup differences was tested with the normal approximation of the binomial (see Hays, 1963) using N = 72 and P = 1/2. That is, the 72 attributes and contrasting ideas were treated as the observations, and the chance expectation for the proportion of observations that would be greater for one personality subgroup than for the other was assumed to be 1/2.

Structural Differentiations

Results of dimensional and clustering analyses for contrasting personality subgroups were also differentiated in a variety of ways.

The 10-factor varimax solutions were summarized by counting the times that the pairs of attributes and contrasting ideas had highest loadings on the same factor.

The significance of the count for each group was evaluated with an exact binomial test (see Hays, 1963), using N = 36 (the number of pairs of attributes and contrasting idea) and P = 1/10 (the likelihood that an attribute and its contrasting idea will have

highest loadings on the same factor in a 10-factor solution). The statistical significance of the difference between the number of paired highest-loadings for different subgroups was evaluated with the normal approximation to the binomial. For these tests, $NP_1 = NP_2 = 36 \cdot 1/10 = 3.6$ (the expected count for paired attributes and contrasting ideas) and $V(NP_1) = V(NP_2) = NPQ = 36 \cdot 1/10 \cdot 9/10 = 3.24$ (the expected variance of an observed frequency).

The separate varimax rotations of 2 through 10 factors were evaluated in terms of: (1) the largest number of attribute and contrasting idea pairs having highest loadings on the same factor (dimensional usage), (2) the highest proportion of dimensional usage concentrated in a single factor, (3) the proportion of variance accounted for by the factors rotated, and (4) the number of factors rotated before a factor had only six highest loadings (other cutoffs should yield similar results).

The results of structure-similarity analyses examining the meaning-systems for liked and disliked objects were evaluated with a Mann-Whitney U test (Siegel, 1956). This test compared the distribution of structure-similarity values for the 10 individuals in one Dogmatism subgroup with the distribution of values for the other Dogmatism subgroup.

Summary of Analyses

The various sorts of analyses of Object Descriptions Task data may be summarized as shown in Table 2. Only the differentiation analyses have been summarized here since the results of the product-perception mappings merely served as the data for these final analyses.

TABLE 2

Summary of Differentiation Analyses Performed on the Consumer-Product Perceptions of Contrasting Personality Subgroups

Analyses of Object Descriptions Task Data	Personality Inventories				
	Cognitive Complexity	Dogmatism Scale	Orientation Inventory	Terminal Values	Instrumental Values
Content Differentiations	X	X	X	X	X
Response-Style Differentiations	X	X	X	X	X
Structural Differentiations					
1. Factor Analyses					
a. All objects	X	X			
b. Liked versus disliked objects		X			
2. Structure-Similarity Analysis					
a. Liked versus disliked objects		X			

The table shows that the differentiation analyses were of three main varieties (i.e., content, response-style, and structural differentiations) and that differentiation analyses were performed for contrasting subgroups identified with data from five different personality inventories. The table also shows that content and response-style differentiation analyses were performed on contrasting subgroups for each personality inventory and that structural differentiation analyses were performed for only the Cognitive Complexity and Dogmatism subgroups.

Structural differentiation analyses based on factor analysis results were performed for these latter two inventories (for both inventories there were analyses of distance matrices formed from responses to all objects used in the Object Descriptions Task; for the Dogmatism subgroups results from responses to objects liked were analyzed separately from responses to objects disliked by each S).

Structural differentiation analyses based on the results of structure-similarity analyses were performed for the individual members of the Dogmatism subgroups (structure-similarity analyses were used to compare distance matrices formed for each individual's responses to objects liked and to objects disliked).

CHAPTER IV

RESULTS AND DISCUSSION

Review of the Research Objectives and Strategy

The research question common to all of the analyses reported in this chapter was to what extent to which personality characteristics manifested themselves in the meaning-systems associated with certain consumer-product perceptions. More specifically, the analyses examined the extent to which several different personality characteristics penetrated consumer-product perceptions at each of these three levels: (1) the salient content of sterling silverware perceptions, (2) modes of response to these products, and (3) structural (organizational) characteristics of silverware perceptions. The manner in which results for these three levels of cognitive functioning were interrelated was also considered.

The analyses focused on the three levels of content, response-style, and structure since these have enjoyed considerable attention in the psychological literature and in the literature of other social sciences disciplines. These three topics were also selected because they represented three major aspects of response--what an individual responds to, how an individual uses responses, and the connections among responses.

Although these three aspects of cognitive functioning are well represented in measurement techniques such as the Semantic Differential, social desirability scales, Thurstone attitude scaling, social distance scales, measures of structural balance or consistency, and many others, concern with these topics has had the effect of bringing together diverse and potentially conflicting viewpoints. In particular, these concerns pertain to theory and research on perception (e.g., Allport, 1955; Dember, 1961; Tagiuri and Petrullo, 1958), on response-styles, sets or biases as pervasive cognitive habits (e.g., Cronbach, 1950; Edwards, 1957; Guilford, 1954; Jackson and Messick, 1962), attitude formation (e.g., Brown, 1962; Fishbein, 1967; Insko, 1967), and cognitive organization (Abelson and Rosenberg, 1958; Cartwright and Harary, 1956; Heider, 1946; Rosenberg and Abelson, 1960; Zafonc, 1960). The model presented in Chapter II is a first effort to integrate aspects of these diverse influences, and the hypotheses tested here constitute a test of the model's utility in examining three major aspects of cognitive functioning.

The research strategy employed here was based on the assumption that similarities in certain characteristics of cognitive functioning (i.e., personality characteristics) would be reflected in similarities at more specific levels of cognitive functioning (i.e., characteristics of sterling silverware perceptions). Furthermore, it was assumed: (1) that relationships between these different regions of cognitive systems were potentially complex, and (2) that a typological research strategy was suited to revealing complex within-group commonalities as well as to differentiating between complex systems.

As mentioned in Chapters II and III, two of the personality inventories selected for the research focused on content (Values Survey and Orientation Inventory) while two others focused on factors related to personality structure (Cognitive Complexity Index and Dogmatism Scale). Since it was assumed that different levels of cognitive functioning are simultaneously involved in relationships between different regions of cognitive systems, it was expected that both content and structural personality characteristics would have implications for both the content and organizational characteristics of consumer-product perceptions. While other personality inventories might have been selected for this research, the ones used were sufficiently diverse for testing a variety of hypotheses concerning relationships between personality characteristics and the content, response-style, and structural characteristics of sterling silverware perceptions.

Sterling silver tableware was selected as a member of the class of high quality home furnishings. As mentioned in Chapter III, sterling tableware appeared to be a reasonable selection since it is expensive, is often used in formal social settings, has style as a major component, and has considerable symbolic potential for consumers. In addition, sterling tableware was thought to be a reasonable choice for the present research since it is a relatively small product, competition products are roughly the same size, there is a broad spectrum of different designs, and it is possible to work with a wide variety of designs without introducing color as a complicating factor.

The initial step in performing analyses of content, response-style and structure was to use personality data for identifying

relatively small homogeneous groups of Ss (10 in each group) that were widely separated from one another. After the "types" had been identified, each group's perceptions of selected sterling tableware designs were analyzed. Analyses of content, response-style, and structure were performed for each personality "type." The defining characteristics of each group's perceptions were then used in analyses aimed at differentiating between contrasting personality "types."

The success of these analyses depended largely upon the extent to which: (1) members of a personality "type" had commonalities in their responses to sterling silver tableware, and (2) different personality "types" responded rather differently to these products. The content, response-style, and structural analyses were dependent upon both intra-S and inter-S commonalities for an individual "type." In addition, the differentiation analyses were dependent upon there being substantial differences between "types."

This chapter has been divided into five major parts: (1) content differentiation results, (2) response-style differentiation results, (3) a summary and discussion of content and response-style differentiation results, (4) structural differentiation results, and (5) a summary and discussion of structural differentation results. The content and response-style differentiation results are summarized together because they were performed for contrasting subgroups identified by means of the same personality inventories. While structural differentiation analyses were performed for only a few of the personality subgroups, the summary of these results also

includes a discussion of ways in which these results tie in with the content and response-style differentiation results.

Content Differentiations

The intent of the content differentiation analyses was to seek evidence that personality characteristics are related to the content of consumer-product perceptions. That is, the objective of these analyses was to explore relationships between rather general cognitive characteristics and highly specific responses which are uniquely salient to the members of contrasting types.

The personality inventories which provided the data for typal classification of Ss included two inventories focusing on personality content (Orientation Inventory and Value Survey) and two focusing on personality structure (Cognitive Complexity Index and Dogmatism Scale). Constrasting personality subgroups were identified for each inventory (see Classificatory Analyses of Personality Data, p. 94-97).

The content differentiation analyses performed for contrasting personality subgroups were centered around the following general hypothesis.

> Hypothesis 1: Contrasting personality types may be differentiated in terms of the salient content of their consumer-product perceptions.

The hypothesis implies that: (1) the salient content of people's perceptions of sterling silver tableware will differentiate between contrasting personality types, (2) the differentiating content will make psychological sense when viewed in relation to theory and research for each personality inventory, and (3) the content results

for the four personality inventories will be consistent with theoretical relationships among the personality variables involved.

Techniques such as the Object Descriptions Task and the present method for differentiating between contrasting personality types have not, so far as the author can ascertain, been employed before. On the other hand, pilot research (Price, 1968) employing similar data collection and analysis methods supported the idea that these different cognitive domains are related.

Review of Content Differentiation Procedures

The first step was to perform classificatory analyses of Ss using personality data obtained with the personality inventories (i.e., Cognitive Complexity Index, Dogmatism Scale, Orientation Inventory, and Value Survey). Contrasting personality types were thereby identified and the Object Descriptions Task data for each personality subgroup were analyzed separately. Each personality subgroup used in these analyses consisted of 10 Ss.

A group-composite 72 by 72 attribute interassociation matrix was calculated for each subgroup, where the relationship between any two attributes was based on summation across distances calculated from Ss' responses to 18 sterling silverware patterns. The 72 attributes consisted of the 36 presented to Ss and the 36 that Ss had to define for themselves.

The 72 by 72 matrix for each personality subgroup was analyzed with the L.A.W.S. hierarchical clustering method, and

content which differentiated between the product perceptions of contrasting subgroups was identified as described below:

1. Salient content for the various personality subgroups was identified by selecting approximately 36 attributes or contrasting ideas found in isolated content groupings throughout the cluster hierarchy (see Content Analyses in Chapter III). The weighted-affect score for each content item (see Response-Style Analyses, pp. 108-110) was assigned to the selected content. Finally, the weighted-affect scores were used to rank-order the content from highest positive to highest negative weighted-affect score.

2. The vectors of salient content for contrasting personality subgroups were then compared in order to identify content which was salient for one subgroup but not for another subgroup. That is, contrasting subgroups were differentiated in terms of their distinctive content characteristics.

The resulting content differentiators were then evaluated by considering the degree to which the configuration related to both theory and research for the personality variable concerned.

The steps of the analyses are summarized in Figure 10. While the flow-chart represents the steps for differentiating between two groups, the procedures may be extended to situations involving more than two groups.

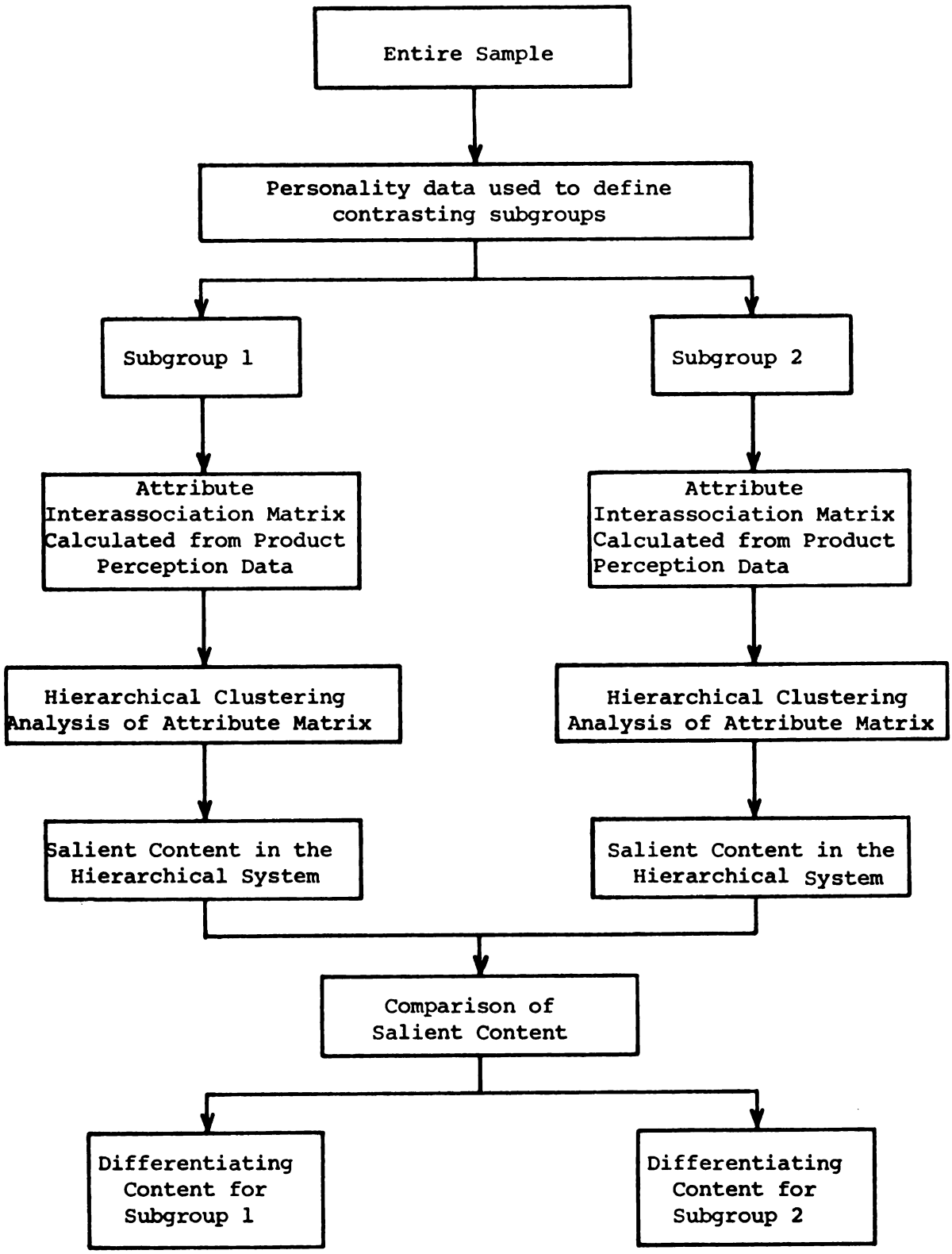

Figure 10. A Flowchart for Content Differentiations Between the Consumer-Product Perceptions of Contrasting Subgroups.

Results of Content Differentiation Analyses

Results from the content differentiation analyses performed for contrasting personality types are discussed in the following sections. All four personality inventories were involved in these analyses.

Cognitive Complexity Index.--While the Cognitive Complexity Index deals mainly with cognitive structure or organization, it was used here to test whether the cognitive complexity variable also has implications for the content of consumer-product perceptions. That is, "types" were identified through the collection of Cognitive Complexity data and these "types" were compared in order to examine whether a structural personality variable manifests itself in the content of sterling silver tableware perceptions.

1. Characteristics of the Cognitive Complexity subgroups.--The Cognitive Complexity scores for Ss in the Low Complexity subgroup ranged from .536 to .442 and had a mean of .468, while scores for High Complexity Ss ranged from .219 to .152 and had a mean of .202 (scores are inversely related to Cognitive Complexity). For the scoring system used, the possible range of scores was .000 to 1.000. The average for Low Complexity Ss was +1.71 standard deviations from the mean for all 105 Ss, and the average for High Complexity Ss was -1.58 standard deviations from the mean.

2. Product perceptions of the Complexity subgroups.--The lists of content resulting from differentiation analyses of

consumer-product perceptions for the Cognitive Complexity subgroups are shown in Table 3. For the Low Complexity subgroup, 19 of 34 salient attributes and contrasting ideas were differentiators. For the High Complexity subgroup, 20 of 27 salient characteristics were differentiators (there were only 27 salient content items since the next cluster would have taken the count beyond the 36 salient attributes and contrasting ideas).

For the Low Complexity subgroups, differentiators receiving the most positive response included such characteristics as Adaptive, Secure, Reserved, and c.i. to Masculine[1] while the most negative responses were to characteristics such as c.i. to Individualistic,[2] c.i. to Cooperative, c.i. to Adaptive, and c.i. to Successful. When considered in conjunction with their valence (the weighted-affect scores), the major differentiators as well as some of the less extreme differentiators seem to fit together rather well. The general impression derived from this configuration is a combination of social and intellectual conservatism, self-orientation, and middle class ethics plus some indications of preference for traditional and organized design.

The differentiators for the High Complexity subgroup suggest rather different concerns. Characteristics perceived most positively

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[1]The implication of this result is that a contrasting idea to Masculine (e.g., Feminine) is a salient characteristic with positive valence.

[2]When a contrasting idea to a characteristic has negative valence, the result is similar to a double negative. The finding that a contrasting idea to Individualistic has negative valence carries the implication that a characteristic such as Unparticular has positive valence.

TABLE 3

Salient Content Differentiating Between
the Consumer-Product Perceptions
of Cognitive Complexity Subgroups

Low Cognitive Complexity		High Cognitive Complexity	
Content Differentiators	Weighted-affect scores	Content Differentiators	Weighted-affect scores
Adaptive	.415	Simple	.364
Secure	.318	Spontaneous	.339
Reserved	.193	Youthful	.275
c.i. to Masculine	.188	Trusting	.251
c.i. to Controversial	.131	Innovative	.239
Historical	.095	Leisurely	.221
c.i. to Restrained	.085	c.i. to Heavy	.188
Heavy	.013	Controversial	.171
c.i. to Profound	.007	c.i. to Cautious	.048
c.i. to Proud	-.062	c.i. to Aloof	.029
c.i. to Secure	-.066	c.i. to Youthful	.011
c.i. to Confident	-.075	c.i. to Upper Class	-.006
c.i. to Skilled	-.087	Reserved	-.036
c.i. to Balanced	-.112	c.i. to Futuristic	-.066
c.i. to Sociable	-.119	Restrained	-.110
c.i. to Successful	-.121	Cautious	-.141
c.i. to Adaptive	-.137	c.i. to Profound	-.267
c.i. to Cooperative	-.175	c.i. to Controversial	-.273
c.i. to Individualistic	-.260	c.i. to Innovative	-.289
		c.i. to Spontaneous	-.299

"c.i. to" means "contrasting idea to."

included Simple, Spontaneous, Youthful, and Trusting while the most negative reaction was to c.i. to Spontaneous, c.i. to Innovative, c.i. to Controversial, and c.i. to Profound. Again, positively evaluated differentiators meshed rather well with negatively evaluated differentiators, and the total configuration gives a rather uniform impression of energy, liberalism, and active search for new ideas.

While the probability of obtaining a reasonably well coordinated set of differentiators was not rigorously tested because of the difficulty of specifying a number of parameters with satisfactory precision, it was possible to make some probability estimates. These estimates suggest that the present results had a very low probability of occurring by chance.

Suppose, for example, that 10 of 72 attributes could be associated with one content category and that 4 of the 10 were salient differentiators for one group while only one was a differentiator for another group. The probability of such a result may be calculated as follows. First, the probability that an attribute will be in the salient half is 36/72. Second, the probability that a characteristic will be one of the 10 related attributes is 10/72. The probability of being in the featured half and among the 10 related characteristics is 1/2 x 10/72 = 5/72. Using this probability in the binomial formula, the probability that at least 4 of the 10 characteristics will be differentiators for one group is .0035, and the probability that 0 or 1 of these will be differentiators for the other subgroup is .8502. The probability of having 4 or more occur

for one subgroup and no more than 1 occur for the other subgroup is .0029 (.0035 x .8502 = .0029).

On the whole, the ease with which the content differentiation results can be interpreted as reflecting rather different viewpoints suggests that Hypothesis 1 may be accepted. That is, results gave some support to the idea that personality "types" may be differentiated in terms of the salient content of the consumer-product perceptions. In addition, the particular differentiators yielded by these analyses were in keeping with the findings that Cognitive Complexity has been found to correlate with youthfulness, dynamism, and openness to new ideas (Bieri, 1966).

Dogmatism Scale.--While the Dogmatism Scale also has implications for cognitive structure, it too was used to test whether the dogmatism variable also manifests itself in the content of consumer-product perceptions.

1. Characteristics of the Dogmatism subgroups.--Scores for Low Dogmatism Ss ranged from 56 to 64 and had a mean of 60.2 while scores for High Dogmatism Ss ranged from 94 to 108 and had a mean of 98.3. Relative to the range of possible scores (40 to 140), the average for High Dogmatism Ss especially was not very extreme; however, in terms of the distribution of scores for Ss in the sample the subgroups were well separated. The mean for the Low Dogmatism was -1.98 standard deviations from the mean for all 105 Ss and for the high dogmatics it was +2.01 standard deviations from the overall mean.

2. Product perceptions of the Dogmatism subgroups.--The content configurations resulting from differentiation analyses of consumer-product perceptions for the Dogmatism subgroups are shown in Table 4. For the Low Dogmatism subgroup, 20 of 36 salient characteristics were differentiators. For the High Dogmatism subgroup, 18 of 34 salient characteristics were differentiators.

For the Low Dogmatism subgroups, the most favorable responses were to such characteristics as Simple, Youthful, c.i. to Reserved, and Leisurely while the most negative responses were to such content as c.i. to Dynamic, c.i. Innovative, c.i. to Controversial, and c.i. to Spontaneous. When considered in conjunction with their weighted-affect scores these, and several other differentiators, suggest a rather consistent picture of energy, liberalism, and an active search of new ideas.

From the High Dogmatism subgroup, there was a rather different set of differentiators. The most favorable responses were to differentiators such as Skilled, Individualistic, c.i. to Asymetrical, and Upper Class. The more negative responses were to such content as c.i. to Sociable, c.i. to Proud, c.i. to Successful, and c.i. to Individualistic. Again, the differentiators provide a rather uniform impression of conservatism, self-orientation and a middle class ethic, plus some indications of preference for regular, organized and, perhaps, traditional design.

It should also be noted that the configuration of differentiators for the Low Dogmatism subgroup gives much the same impression as the configuration for the High Complexity subgroup.

TABLE 4

Salient Content Differentiating Between
the Consumer-Product Perceptions
of Dogmatism Subgroups

Low Dogmatism		High Dogmatism	
Content Differentiators	Weighted-affect scores	Content Differentiators	Weighted-affect scores
Simple	.353	Skilled	.414
Youthful	.305	Individualistic	.364
c.i. to Reserved	.295	c.i. to Asymmetrical	.359
Leisurely	.282	Upper Class	.350
c.i. to Restrained	.215	Cooperative	.273
c.i. to Cautious	.206	Trusting	.258
c.i. to Heavy	.174	Historical	.238
c.i. to Urban	.146	c.i. to Unsystematic	.223
c.i. to Proud	.126	c.i. to Historical	.103
Upper Class	-.016	Reserved	.092
c.i. to Futuristic	-.079	c.i. to Aloof	.084
Reserved	-.116	Heavy	.017
c.i. to Profound	-.136	c.i. to Geometrical	-.017
Restrained	-.154	c.i. to Skilled	-.055
Cautious	-.173	c.i. to Individualistic	-.070
c.i. to Secure	-.188	c.i. to Successful	-.074
c.i. to Spontaneous	-.204	c.i. to Proud	-.089
c.i. to Controversial	-.216	c.i. to Sociable	-.096
c.i. to Innovative	-.224		
c.i. to Dynamic	-.242		

"c.i. to" means "contrasting idea to."

Similarly, the configuration for the High Dogmatism subgroup fits with the one for the Low Complexity Subgroup. Since many of the content areas measured in the Dogmatism Scale are reflected in the differentiators for sterling silverware perceptions, the results seem consistent with the theory underlying the Dogmatism Scale as well as with the theory underlying the Cognitive Complexity Index. As with the results for the Cognitive Complexity Index, these results also support Hypothesis 1 and thereby give added strength to the idea that personality characteristics manifest themselves in the content of consumer-product perceptions.

Orientation Inventory.--The subscales of the Orientation Inventory are primarily concerned with cognitive content and have been used to identify Ss who were predominantly self, interaction, or task oriented. Unlike the Cognitive Complexity Index and the Dogmatism Scale, which pertain mainly to personality structure, the Orientation Inventory is concerned with whether broad qualitative characteristics manifest themselves in the content of consumer-product perceptions.

1. Characteristics of the Orientation subgroups.--Although the Orientation Inventory data seldom met Bass's criteria (Bass, 1962) for classifying Ss as members of one orientation type (less than 35 per cent, rather than the 80 per cent expected by Bass), a cluster analysis of inter-S similarities yielded reasonably well separated clusters of Ss which could be identified with one or another of the three orientation types.

The Interaction-Oriented subgroup had greater internal consistency than the other two subgroups because: (1) Bass's criteria for classification were satisfied more often, and (2) most such Ss in the sample could be found in one large cluster. Clustering results also suggested that Interaction-Oriented Ss were somewhat more like Self-Oriented Ss than they were like Task-Oriented Ss. If one thinks of the three orientation types as the points of a triangle, one can see that average intercluster dissimilarity results confirmed the clustering results (Interaction to Self dissimilarity was 130.91 and Interaction to Task dissimilarity was 149.99).

The Self-Oriented Ss were also clustered together pretty well but there was a clear tendency for them to be more like Task-Oriented than like Interaction-Oriented Ss. Again, average intercluster dissimilarity results confirmed the clustering results (Self to Task dissimilarity was 91.56 and Self to Interaction dissimilarity was 130.91).

The Task-Oriented Ss comprised the least unified subgroup. Some Ss appeared to be like Interaction-Oriented Ss while others were more like Self-Oriented Ss. Average dissimilarity calculations, however, indicated a clear tendency for Task-Oriented Ss to be more like Self-Oriented than like Interaction-Oriented Ss. (Task to Self was 91.65 and Task to Interaction was 149.99.)

2. Product perceptions of the Orientation subgroups.--The subscale scores on the Orientation Inventory and the cluster dissimilarities indicated that the Interaction-Oriented subgroup

could be expected to be least like the other subgroups. The salient content in this subgroup's perceptions of sterling silverware was first compared with the salient content for the other two subgroups. While the Self-Oriented and Task-Oriented subgroups were also compared, it was expected that differences would be slight. Nevertheless, it was hoped that at least some of Bass' expectations concerning differences between these two types would manifest themselves in people's associations with sterling silver tableware.

a. Self-Oriented versus Interaction-Oriented subgroups.--Of the 36 salient characteristics for the Self-Oriented subgroup, 15 were differentiators between the Self- and Interaction-Oriented subgroups. Fourteen of the 36 salient characteristics for Interaction-Oriented subgroup differentiated between these subgroups.

For the Self-Oriented subgroup, the differentiators with greatest positive valence (see Table 5) included Individualistic, Trusting, Urban, and Cooperative while the negative ones were c.i. to Innovative, c.i. to Impressive, Cautious, and Restrained. While these and other differentiators in the configuration do not suggest a clear-cut interpretation, it does seem that members of the Self-Oriented subgroup could be described as desiring a predictable environment, personally impulsive, concerned with their own status, and perhaps somewhat aggressive. There also appears to be a definite preference for organized, traditional styling. While the place of such content as Trusting and Cooperative is a little hard to understand, it seems reasonable to speculate that these two attributes reflect how subgroup members expect others to act toward them in

TABLE 5

Salient Content Differentiating Between the Consumer-Product Perceptions of Self-Oriented and Interaction-Oriented Subgroups

Self-Oriented		Interaction Oriented	
Content Differentiators	Weighted-affect scores	Content Differentiators	Weighted affect scores
Individualistic	.322	Futuristic	.409
Trusting	.297	c.i. to Impersonal	.357
Urban	.271	c.i. to Heavy	.351
Cooperative	.269	c.i. to Historical	.220
Spontaneous	.267	c.i. to Reserved	.158
Confident	.236	c.i. to Proud	.138
Geometrical	.172	c.i. to Youthful	.137
c.i. to Unsystematic	.135	c.i. to Refined	.078
c.i. to Serious	.132	c.i. to Profound	.068
c.i. to Simple	.064	c.i. to Skilled	.064
Historical	.064	c.i. to Leisurely	.047
Restrained	-.017	c.i. to Controversial	.017
Cautious	-.062	Aloof	.001
c.i. to Impressive	-.161	c.i. to Dynamic	-.031
c.i. to Innovative	-.214		

"c.i. to" means "contrasting idea to."

order that the status quo might be preserved. This interpretation seems to fit with a number of the correlations with Self-Orientation reported by Bass (1967). For example, it has been found that Self-Orientation correlates positively with disagreeableness, dogmatism, aggressiveness, sensitivity, suspiciousness, excitability, immaturity, lack of control, and lack of need for change.

The positive differentiators for the Interaction-Oriented Subgroup included Futuristic, c.i. to Impersonal, c.i. to Heavy, and c.i. to Historical. The only negative differentiator was c.i. to Dynamic. These characteristics and several others with relatively high weighted-affect scores give the impression that the subgroup prefers warm, open, and fresh relationships which are not constrainted by social status barriers, and other contributors to social distance. There is also a rather clear preference for simple, modern styling. Again, the general impression seems consistent with results reported by Bass. For example, positive correlations have been found between Interaction-Orientation and need for affiliation, group dependence, lack of need for achievement, lack of need for autonomy, need for nurturance, sociability, and lack of need for aggression.

Task-Oriented versus Interaction-Oriented persons.--Among the 36 featured characteristics for the Task-Oriented subgroup were 13 differentiators between the Task and Interaction-Oriented subgroups (see Table 6). Of the 36 featured characteristics for Interaction-Oriented Ss, 12 differentiated between these subgroups.

For the Task-Oriented subgroup, highest positive valence was associated with Individualistic, Confident, Innovative, and Historical,

TABLE 6

Salient Content Differentiating Between the Consumer-Product Perceptions of Task-Oriented and Interaction-Oriented Subgroups

Task-Oriented		Interaction-Oriented	
Content Differentiators	Weighted-affect scores	Content Differentiators	Weighted-affect scores
Individualistic	.273	Leisurely	.372
Confident	.202	c.i. to Impersonal	.357
Innovative	.181	c.i. to Heavy	.351
Historical	.155	Skilled	.342
Geometrical	.112	Profound	.223
Restrained	.066	c.i. to Masculine	.172
c.i. to Futuristic	.042	c.i. to Proud	.138
c.i. to Unsystematic	.024	c.i. to Leisurely	.047
Cautious	.000	c.i. to Confident	.041
c.i. to Cautious	-.059	c.i. to Controversial	.017
c.i. to Restrained	-.113	Impersonal	.009
c.i. to Innovative	-.182	Aloof	.001
c.i. to Impressive	-.209		

"c.i. to" means "contrasting idea to."

while negative valence was associated with c.i. to Impressive, c.i. to Innovative, c.i. to Restrained, and c.i. to Cautious. As a whole, the configuration seems to suggest activity, dynamism, self-control, concern with organization, and concern with new ideas. There is also some evidence of a preference for organized, but perhaps traditional, styling. Unlike the Self-Oriented subgroup examined in the preceding section, the Task-Oriented subgroup evidenced rather little concern with matters of sociability. That is, the Task-Oriented subgroup seemed less like the Interaction-Oriented subgroup than the Self-Oriented subgroup did, a result which fits with the Orientation Inventory results reported earlier. Furthermore, Bass has reported positive correlations between Task-Orientation and self-sufficiency, control, seriousness, low dogmatism, objectivity, introversion, restraint, and low anxiety.

The most positive differentiators for the Interaction-Oriented subgroup were Leisurely, c.i. to Impersonal, c.i. to Heavy, and Skilled. There were no negative differentiators. As in the preceding comparison with the Interaction-Oriented subgroup, the differentiators with relatively high weighted-affect scores suggest a preference for warm, intimate and "meaningful" relationships that are not constrained by social barriers. There do not seem to be very definite styling preferences, but, as will be seen in the following comparison, this may be due to rather mixed styling preferences on the part of the Task-Oriented subgroup.

c. Self-Oriented versus Task-Oriented subgroups.--Consistent with the findings that the Self-Oriented and Task-Oriented subgroups were relatively close in an inter-person space, there were rather few differentiators between these subgroups (see Table 7). Nevertheless, the differentiators which emerged seem consistent with the characterizations of these subgroups derived from comparisons with the Interaction-Oriented subgroup. Specifically, differentiators for the Self-Oriented subgroup give the impression of impulsiveness, concern with status, personal comfort, and social relationships that are not threatening. On the other hand, differentiators for the Task-Oriented subgroup give the impression of an active concern with new ideas yet a systematic and orderly approach to things, an element of seriousness, and some preference for modern styling.

3. Summary of Orientation Inventory results.--Despite the fact that the Orientation Inventory did a rather poor job of identifying orientation types, the content differentiations indicated that there were connections between these personality types and perceptions of sterling silver tableware. The connections manifested themselves in the following ways: (1) content differentiators yielded impressions which seemed consistent with theoretical descriptions of the three types, (2) the differentiators seemed to fit with the sorts of variables found to correlate with these types, and (3) the similarity of one type to another was reflected in the content configurations which differentiated the product perceptions of the different types.

TABLE 7

Salient Content Differentiating Between the Consumer-Product Perceptions of Self-Oriented and Task-Oriented Subgroups

Self-Oriented		Task-Oriented	
Content Differentiators	Weighted-affect scores	Content Differentiators	Weighted-affect scores
Trusting	.297	Futuristic	.082
Urban	.271	c.i. to Futuristic	.042
Cooperative	.269	c.i. to Historical	-.010
Spontaneous	.267	c.i. to Youthful	-.084
Leisurely	.219	c.i. to Reserved	-.085
c.i. to Masculine	.216	c.i. to Restrained	-.113
c.i. to Serious	.132	c.i. to Dynamic	-.232
c.i. to Simple	.064	c.i. to Refined	-.277
Impersonal	-.098		

"c.i. to" means "contrasting idea to."

Although it was not feasible to examine the statistical significance of content results, the patterns of differentiators yielded for the Orientation Inventory subgroups again suggest support for Hypothesis 1. To obtain evidence here that these personality characteristics manifested themselves in consumer-product perceptions was particularly encouraging because the subgroups were neither especially homogeneous nor very widely separated.

Value Survey.--The two subscales of the Value Survey were also concerned with cognitive content characteristics. The data for each subscale were separately analyzed to identify contrasting groups of Ss having similar value configurations. The consumer-product perceptions of these subgroups were then analyzed and differentiated in terms of content.

1. Characteristics of the Terminal Values subgroups.--The Terminal Values subscale includes personal values pertaining to "end-status of existence." That is, such values constitute general principles or conditions which are judged as personally or socially worth striving for.

a. Terminal Values configurations.--As mentioned earlier (see Classificatory Analyses of Personality Data in Chapter III), rank-order correlations among the Terminal Value rankings given by all Ss in the study were calculated, the resulting matrix was cluster analyzed, and two contrasting subgroups of Ss were selected for the analyses of consumer-product perceptions. These subgroups will be referred to as Subgroup 1 and Subgroup 2.

The average within-cluster correlation for Subgroup 1 was .742 and for Subgroup 2 it was .583. The average between-cluster correlation was .390. Since the within-cluster correlations were not very high and the between-cluster correlations were not very low, the success of efforts to differentiate between the product perceptions of these subgroups rested upon their sensitivity to subtle, rather than gross, differentiations.

The Terminal Value configurations for the two subgroups are presented in Table 8. The Values are presented in order of the average rank ascribed to a value by the S's in a subgroup. While only one value was ranked among the top nine for one subgroup and among the bottom nine for the other group (Salvation--16.60 for Subgroup 1 and 1.60 for Subgroup 2), the relative rankings of certain combinations of other values give an impression of rather different viewpoints as described below.

The Subgroup 1 configuration gives the impression of a liberal, humanistic viewpoint. High ranking values that were several positions higher than the same values for Subgroup 2 included A World of Peace, Equality, and Inner Harmony. The only value ranked much lower by this group was Salvation; nevertheless, it should be noted that most values related to achievement, status, and religiosity were ranked lower by Subgroup 1.

The Subgroup 2 configuration suggests a conservative, middle class, or traditional viewpoint. High ranking values that were several positions higher than the same values for Subgroup 1 included Salvation, and Self-Respect. The only low ranking value

TABLE 8

Value Configurations for Terminal Values Subgroups

Subgroup 1		Subgroup 2	
Value	Average Rank	Value	Average Rank
A World at Peace	2.30	Salvation*	1.60
Equality	3.20	Mature Love	5.60
Freedom	5.30	A World at Peace	5.80
Inner Harmony	5.70	Self-Respect	5.80
Mature Love	5.70	Freedom	6.00
Wisdom	5.80	Happiness	6.60
Happiness	6.10	Wisdom	7.40
Self-Respect	7.40	Equality	7.50
True Friendship	8.40	Inner Harmony	7.70
Family Security	9.30	Family Security	8.20
A Sense of Accomplishment	10.40	True Friendship	9.10
An Exciting Life	11.00	A Sense of Accomplishment	12.70
A World of Beauty	12.20	A Comfortable Life	13.00
A Comfortable Life	14.70	An Exciting Life	14.20
Pleasure	15.00	Social Recognition	14.50
Social Recognition	15.30	Pleasure	14.90
Salvation*	16.60	A World of Beauty	15.00
National Security	16.70	National Security	15.40

*Major differentiations.

which was several positions lower for this group was A World of Beauty. Nevertheless, considering the configuration as a whole, it appears that Subgroup 2 is self-oriented (concern with Salvation, Self-Respect, and Freedom) and concerned that social relationships proceed smoothly (concern with Mature Love and A World at Peace).

The similarity of these results to ones obtained with factor analyses of Terminal Values are striking. In factor analyses of other versions of the Terminal Values scale, Beech (1966) and Hollen (1967) both found a dimension which they labeled as "concern with others versus concern with self," or "social versus personal," or "mankind in general versus myself personally." The dimension had such values as A World of Peace and Equality at one end, and Self-Respect and Maturity at the other end. Similar trends have been evidenced in Rokeach's (1972) comparisons of liberals and conservatives. For liberals, Equality, Freedom, and A World at Peace were ranked high while Salvation was ranked low. For conservatives, Salvation and Freedom were ranked high while Equality was ranked somewhat lower.

These results support the present approach to identifying contrasting personality subgroups. The results imply that the methods employed here are sensitive to major dimensions of individual differences and that these dimensions may be rather easily detected in relatively small groups of Ss. The results also suggest that a typological model of individual differences is realistic.

It should also be noted that the value configurations for these subgroups were very similar to results obtained in a pilot

study of the present research strategy (Price, 1968). One subgroup seemed to reflect a liberal, humanistic viewpoint (A World at Peace, Freedom, and Equality were ranked high while Salvation, Respect from Others, and Self-Fulfillment were ranked low). For the other, a more conservative, self-oriented perspective was evident (Salvation, Comfortable Life, Personal Security, Freedom, and Self-Fulfillment were ranked high while A World of Beauty, A World at Peace, and Equality were ranked low). The degree of correspondence seems all the more striking since a different form of the Terminal Values scale was used, there were only 41 Ss in the study, and the contrasting subgroups contained only 4 Ss each. In other words, it appears that hierarchical clustering analyses can identify major viewpoints or types.

b. Product perceptions of the Terminal Values subgroups.-- As with the three personality inventories already discussed, the contrasting Terminal Value subgroups were differentiated in terms of their responses to sterling silver tableware. The resulting content differentiations are shown in Table 9. For Subgroup 1, 12 of 37 salient characteristics were differentiators. For Subgroup 2, 13 of 37 salient characteristics were differentiators.

For Subgroup 1, the differentiators used most favorably were Simple, Futuristic, Youthful and Innovative while the most unfavorable ones were c.i. to Successful, c.i. to Youthful, c.i. to Spontaneous, and c.i. to Proud. On the whole, the characteristics with strong weighted-affect give an impression of activity, dynamism, liberalism, search for new ideas, and a preference for modern styling.

TABLE 9

Salient Content Differentiating Between the Consumer-Product Perceptions of Terminal Value Subgroups

Subgroup 1		Subgroup 2	
Content Differentiators	Weighted-affect scores	Content Differentiators	Weighted-affect scores
Simple	.383	Skilled	.381
Futuristic	.369	Balanced	.366
Youthful	.350	Cooperative	.259
Innovative	.334	c.i. to Impersonal	.251
Serious	.262	Urban	.211
c.i. to Historical	.218	Leisurely	.210
c.i. to Cautious	.018	c.i. to Masculine	.168
c.i. to Futuristic	-.044	c.i. to Unsystematic	.138
c.i. to Proud	-.053	c.i. to Youthful	.120
c.i. to Spontaneous	-.132	c.i. to Urban	.094
c.i. to Youthful	-.133	c.i. to Futuristic	.040
c.i. to Successful	-.138	c.i. to Profound	-.033
		c.i. to Adaptive	-.193

"c.i. to" means "contrasting idea to."

For Subgroup 2, the differentiators used most favorably were Skilled, Balanced, Cooperative, and c.i. to Impersonal while the most negative content was c.i. to Adaptive, and c.i. to Profound (these were the only attributes with negative weighted-affect scores). The impression derived from these more extreme differentiators as well as from the remaining differentiators is one of concern with quality, organization, unstrained social relationships, and a preference for more traditional styling.

By way of comparison, it is important to note that these results were also very similar to those of the pilot study mentioned earlier (Price, 1968). The differentiators for the subgroup most like Subgroup 1 included Plain, Assymetrical, Dynamic, Bold, and Unconventional while the differentiators for the subgroup most like Subgroup 2 included Technically Excellent, Sculptured, Sophisticated, Charming, Elaborate, Highly Detailed, Secure, Mature, and Heavy.

On the whole, the content differentiations seem reasonably consistent with differences between the value systems of the two subgroups. The results suggest that Terminal Values are connected with people's association with everyday objects. Important Terminal Values were reflected in the characteristics which were liked. Similarly, important Terminal Values appeared to underlie the dislike of characteristics implying the opposite of these Values. These results again suggest that Hypothesis 1 can be accepted.

2. Characteristics of the Instrumental Values subgroups.--The Instrumental Values subscale includes values pertaining to "modes of conduct." That is, such values constitute standards for judging the behavior of self or others in all situations and with respect to all objects.

a. Instrumental Values configurations.--The two subgroups identified through a cluster analysis of inter-personal correlations among Instrumental Values rankings will again be called Subgroup 1 and Subgroup 2.

The average within-cluster correlation for Subgroup 1 was .713, the average for Subgroup 2 was .655, and the average between-cluster correlation was .316. Since within-cluster correlations were not high and between-cluster correlations were not low, the success of the analyses again depended on their sensitivity to subtle differentiations.

The Instrumental Values configurations for the two subgroups are presented in Table 10. The values are presented in the order of the average rank ascribed to a value by the Ss in a subgroup.

The Instrumental Values, which were ranked in the upper half for Subgroup 1 and in the lower half for Subgroup 2 (and vice versa), are suggestive of two rather different perspectives. For Subgroup 1, the important values were Courageous, Independent, and Intellectual. The values with low rank were Cheerful, Forgiving, and Helpful. Since the same values appear in both lists, the differentiators with high or low importance for Subgroup 2 are necessarily a mirror image of those for Subgroup 1.

TABLE 10

Value Configurations for Instrumental Value Subgroups

Subgroup 1		Subgroup 2	
Value	Average Rank	Value	Average Rank
Broadminded	2.70	Loving	2.30
Intellectual*	2.80	Broadminded	3.90
Independent*	3.70	Forgiving*	4.20
Imaginative	4.10	Cheerful*	5.10
Courageous*	5.20	Honest	5.80
Honest	6.60	Helpful*	6.00
Loving	8.00	Imaginative	6.70
Responsible	8.10	Responsible	8.30
Capable	10.80	Capable	9.20
Helpful*	10.80	Courageous*	10.10
Cheerful*	11.00	Intellectual*	11.50
Forgiving*	11.00	Ambitious	12.70
Self-Controlled	11.20	Polite	13.10
Ambitious	13.00	Logical	13.50
Logical	13.30	Independent*	13.80
Polite	15.70	Clean	14.00
Clean	15.90	Obedient	15.40
Obedient	17.10	Self-Controlled	16.10

*Major differentiators.

For Subgroup 1, the differentiators give the impression of an active, idea-oriented, and achievement-oriented individual. The differentiators for Subgroup 2, on the other hand, suggest a positive orientation toward others with overtones of a passive or somewhat dependent role in such interactions. Neither configuration can be clearly characterized as liberal or conservative in either an intellectual or style sense, but a tough-minded versus tender-minded distinction seems to apply quite well.

Some recent research by Rokeach (1971), based on the same form of the Value Survey, yielded very similar clusters of Instrumental Values despite a rather different approach to analysis and the use of a national probability sample. A factor analysis of intercorrelations among Instrumental Values revealed two major sets of values. The first factor included such Instrumental Values as Ambitious, Imaginative, Independent, Intellectual, and Logical. The second factor included Cheerful, Clean, Forgiving, Helpful, Honest, Loving, and Polite. The similarity between these results and the ones of the present study seem striking. It appears that values which are high for Subgroup 1 and low for Subgroup 2 and vice versa are plainly representative of differences between the two factors described above. If broad population characteristics can be shown to manifest themselves in the thinking of such small samples of Ss, it seems reasonable to argue that the analysis techniques employed are quite sensitive to important population subtyles.

It is also encouraging to note that the differentiators revealed by the present analyses were again very similar to the results of the pilot study of this research strategy (Price, 1968). The results were similar despite the fact that a 12-value scale was used, that the entire sample consisted of only 41 Ss, and that the subgroups selected for more intensive study contained only four Ss each.

b. Product perceptions of the Instrumental Values subgroups.-- The differences between the product perceptions of the two Instrumental Value subgroups were analyzed in the same way that Object Descriptions Task data were analyzed for other personality subgroups. The resulting content differentiations are presented in Table 11. For Subgroup 1, 13 of 39 salient characteristics were differentiators. For Subgroup 2, 14 of 39 salient characteristics were differentiators.

For Subgroup 1, the differentiators with the greatest positive valence included Innovative, Serious, Secure, and Spontaneous while those receiving the most negative response included c.i. to Refined, c.i. to Innovative, c.i. to Controversial, and c.i. to Spontaneous. As with a number of the previously analyzed configurations of differentiators, the more extreme ones suggest a rather consistent impression when viewed in combination with weighted-affect scores, and these characteristics also fit reasonably well with most of the less extreme differentiators. The general impression suggested by these characteristics seems to be one of an active, achievement-oriented individual who has intense concerns with new ideas and personal security. While the configuration is, in many

TABLE 11

Salient Content Differentiating Between the Consumer-Product Perceptions of Instrumental Value Subgroups

Subgroup 1		Subgroup 2	
Content Differentiators	Weighted-affect scores	Content Differentiators	Weighted-affect scores
Innovative	.342	Adaptive	.422
Serious	.276	c.i. to Impersonal	.364
Secure	.275	Simple	.272
Spontaneous	.241	Historical	.084
c.i. to Reserved	.166	Reserved	.059
c.i. to Urban	.136	Youthful	.045
c.i. to Historical	.132	Restrained	-.012
c.i. to Simple	.090	c.i. to Unsystematic	-.022
c.i. to Youthful	-.021	c.i. to Reserved	-.030
c.i. to Spontaneous	-.138	Cautious	-.099
c.i. to Controversial	-.169	c.i. to Sociable	-.163
c.i. to Innovative	-.176	c.i. to Leisurely	-.179
c.i. to Refined	-.226	c.i. to Cooperative	-.193
		Impersonal	-.347

"c.i. to" means "contrasting idea to."

ways, similar to Task-Orientation as described by Bass, there is an overtone of intensity which is not characteristic of Task-Orientation.

For Subgroup 2, the differentiators receiving the most favorable response included Adaptive, c.i. to Impersonal, Simple, and Historical while responses of negative valence were given to Impersonal, c.i. to Cooperative, c.i. to Leisurely, c.i. to Sociable. These more extreme differentiators convey a rather uniform impression of a person who is other-oriented in a direct personal sense, but the basis of interaction seems to be relaxed and involving minimum risk. In other words, differentiating content is very much like that obtained for the Interaction-Oriented subgroup, and the value configuration for the subgroup also gives a clear impression of Interaction-Orientation (Cheerful, Forgiving, and Helpful were ranked high).

On the whole, the content differentiations for the two subgroups seem consistent with the value configurations for these subgroups. It appears that sterling tableware patterns are liked if important values are associated with them and disliked if unimportant values are associated with them. In other words, the results suggest that Instrumental Values can be reflected in people's perceptions of everyday objects, and the results again support Hypothesis 1.

Response-Style Differentiations

The intent of the response-style differentiation analyses was to seek evidence that personality characteristics are related to response-style characteristics of consumer-product perceptions.

That is, like the content differentiation analyses, the objective was to explore relationships between general cognitive characteristics and highly specific responses which are uniquely salient to the members of contrasting personality types.

The response-style differentiation analyses performed for contrasting personality subgroups were centered around the following hypothesis concerning modes of response to individual content items.

> Hypothesis 2: Contrasting personality types may be differentiated in terms of modes of response to content associated with consumer products.

This hypothesis implies that personality types differ in the ways they respond to content as well as in what content they use to describe their perceptions. More specifically, it was expected that response-style differentiations would make psychological sense when viewed in relation to theory and research pertaining to the personality inventories and when viewed in relation to one another. Finally, it was expected that both personality content and personality structure would have implications for the organization of consumer-product perceptions (see Overview of the Research Strategy, Chapter II).

Review of Response-Style Differentiation Procedures

For the response-style differentiation analyses, the Object Descriptions Task data were handled quite differently from the way they were handled in the content differentiation analyses. The 36 listed attributes and the 36 S-defined contrasting ideas were analyzed individually for each personality subgroup.

For each one of the 72 content items, a bivariate frequency distribution was formed. Each of these distributions summarized a group's strength of association (applicability) and valence (liking) responses to a particular content item. In other words, each bivariate distribution represented the applicability and liking responses of 10 Ss to 18 objects. These distributions may be thought of as summarizing the data in a plane of the data cube representing all the data for one attribute or contrasting idea (see Figure 8). The data of the plane were then summarized in a single two-dimensional distribution having the same form as a single "chip" of the data cube.

Each response distribution was summarized by calculating: (1) the frequency with which a meaning was associated with objects in any degree, and (2) a weighted-affect score summarizing the joint distribution of strength of association and valence responses.

The response distributions for contrasting subgroups were then compared in terms of:

1. The number of times that corresponding content items were more frequently associated with objects by the members of one personality subgroup than by another (greater usage).
2. The number of times that one subgroup obtained weighted-affect scores that were relatively more positive than those obtained by the other group (more positive weighted-affect score).

3. The number of times that one personality subgroup obtained more extreme weighted-affect scores than the contrasting subgroup (more extreme weighted-affect score).

4. The number of times that a group with more extreme weighted-affect scores evidenced extremeness in the positive or negative direction (more extreme and positive versus more extreme and negative).

These four indices roughly correspond to what Guilford (1954) has described as tendencies to mark or not mark responses (usage), willingness to express decisive or incautious reactions (extreme weighted-affect scores), and a set for acquisence (positive weighted-affect scores as well as the combination of intensity and valence).

The statistical significance of the first three methods of differentiating between subgroups was evaluated with the normal approximation to the binomial, using N = 72 (the total number of attributes and contrasting ideas) and P = 1/2 (the probability that an index will have a greater value for one subgroup than for another). The significance of the fourth comparison method was also evaluated with the normal approximation to the binomial, using the number of extreme scores for a group as N, and P = 1/2 as the probability that an extreme score would be positive (or negative).

The steps of these response-style analyses are summarized in Figure 11. Again, the flowchart represents the steps for differentiating between two groups and may be extended to situations involving more than two groups.

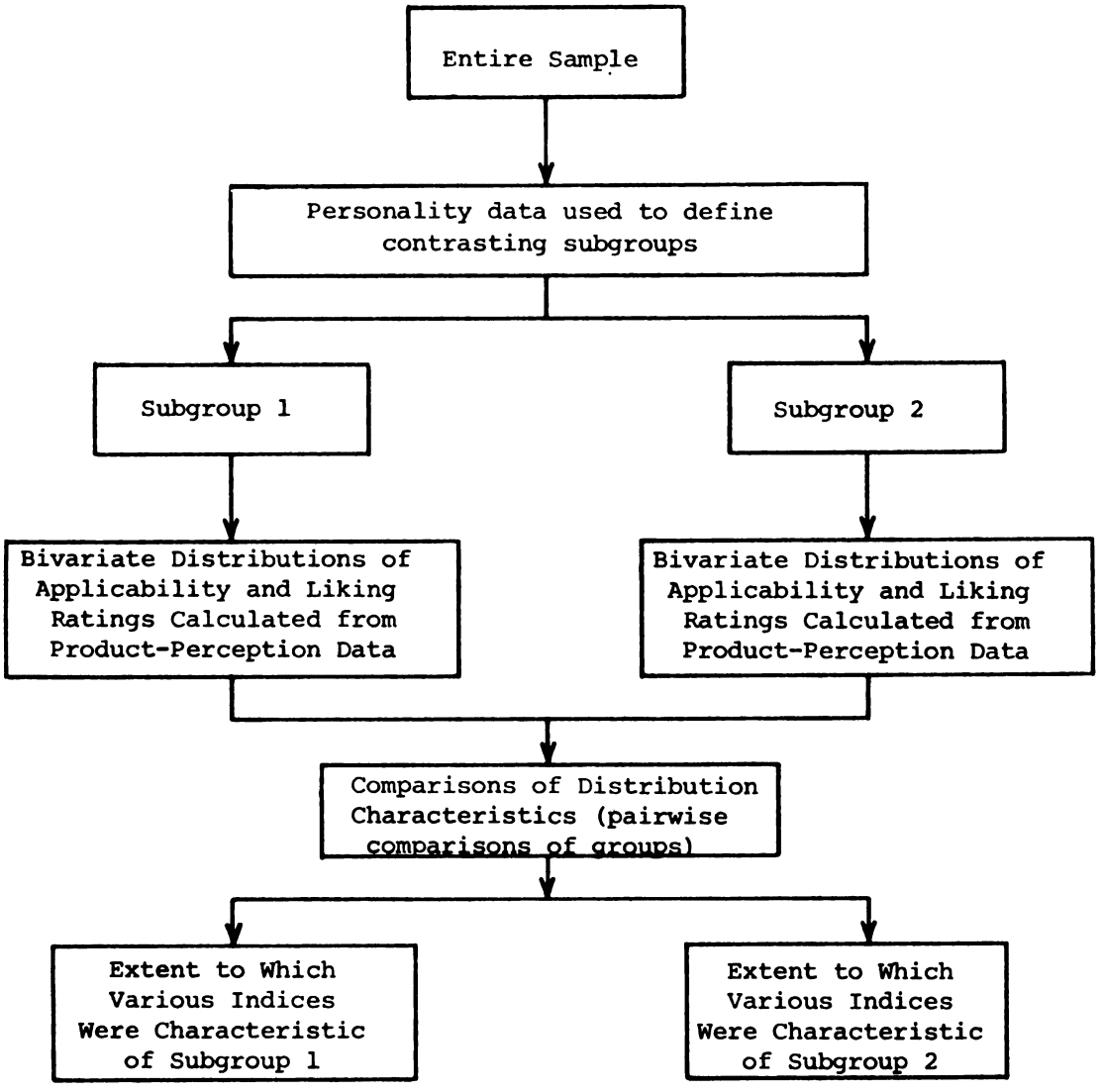

Figure 11. A Flowchart for Response-Style Differentiations Between the Consumer-Product Perceptions of Contrasting Groups.

Results of Response-Style Differentiation Analyses

Response-style differentiations between contrasting personality subgroups are presented in Tables 12 through 18. In so far as possible, contrasting subgroups have been ordered so as to maximize the similarity of results presented in corresponding rows of different tables.

Cognitive Complexity Index.--The Cognitive Complexity Index attempts to measure an enduring mode of cognitive organization which is thought to manifest itself in the perception of many different stimuli, namely, cognitive differentiation. These analyses seek to reflect this characteristic in the perception of consumer products.

1. Characteristics of Complexity subgroups.--The contrasting subgroups used in the content differentiation analyses were also used for the response-style differentiations (see Characteristics of the Cognitive Complexity subgroups, p. 129, for a full description of these results).

2. Product perceptions of Complexity subgroups.--With respect to the four response-style indices, Table 12 shows substantial differences between the Cognitive Complexity subgroups. The Low Complexity subgroup evidenced significant tendencies for greater usage of content, for more positive weighted-affect scores, and for more extreme weighted-affect scores to have positive rather than negative valence. From the perspective of the High Complexity subgroup, the results show that such Ss are less like to use content,

TABLE 12

Response-Style Differences Between the Consumer-Product Perceptions of Cognitive Complexity Subgroups

Personality Subgroups	Frequency of:				
	Greater Usage	More Positive Weighted-affect	More Extreme Weighted-affect	More Extreme Weighted-affect having	
				Positive Valence	Negative Valence
Low Complexity Subgroup	64**	47*	43	33**	10
High Complexity Subgroup	8	25	29	15	14
Total	72	72	72	72	

*Pr < .05, 2-tailed.

**Pr < .01, 2-tailed.

have more diverse distributions of applicability and liking responses, and give extreme responses with positive valence about as often as ones with negative valence.

In addition, the results for extreme positive and negative weighted-affect scores suggest that Low Complexity Ss are sensitized to certain content while High Complexity Ss have more diverse perceptions. Low Complexity Ss appear to have responded positively when preferred content was perceived to apply strongly and negatively when preferred content was perceived to apply only slightly. On the other hand, High Complexity Ss appear to have given more diverse valence responses at all levels of applicability.

On the whole, these results seem consistent with the theory of cognitive complexity and with perceptual differences which have been observed for different stimuli. According to Bieri (1961, 1966), cognitive complexity is an enduring mode of cognitive organization which manifests itself in the perception of role persons, social situations, physical objects, and other stimuli. Persons with complex or differentiated systems should exhibit greater variety of response to stimuli than persons with simple cognitive systems. That is, high complexity persons are "set" to seek diversity in their environment while low complexity persons are "set" to seek regularity in their environment.

In a review of studies concerning relationships between measures of complexity and information processing, discriminability of stimuli, confidence, judgmental accuracy, and concept attainment, Bieri (1966) has assembled considerable evidence in support of

propositions underlying the theory of cognitive complexity. For example, in a study using a version of Kelly's Role Repetory Test (Kelly, 1955) based on value concepts rather than role persons, Higgins (1959) found that high-complex Ss gave more moderate estimates of the probability of various events and expressed less confidence in their judgments. Higgins concluded that high-complex Ss were more reluctant to advance extreme or definitive estimates and that their estimates were more variable. Correspondingly, in a study of changing impressions of people, Leventhal and Singer (1964) found that cognitively simple judges reported greater clarity in impressions on the basis of initial information than was reported by complex judges. Mayo and Crockett (1964) found that cognitively complex judges were able to integrate contradictory information better than less complex judges. Low-complex persons exhibited striking recency effects while high-complex persons were able to retain and work with more ambivalent impressions.

The response-style results for the present study seemed to provide additional evidence for the generality of cognitive complexity. Not only were high and low-complex persons differentiable but, as illustrated above, many of the detailed findings of the present study correspond to those obtained with other stimulus objects. Clearly, Hypothesis 2 was supported by these results.

Dogmatism Scale.--The Dogmatism Scale is similar to the Cognitive Complexity Index in its concern with an aspect of personality structure. In this case, modes of response to sterling

silverware were related to the "openness" or "closedness" of cognitive systems.

1. Characteristics of Dogmatism subgroups.--The contrasting subgroups used in the content differentiation analyses were also used for the response-style differentiations (see Characteristics of the Dogmatism subgroups, p. 133, for a full description of these results).

2. Product perceptions of Dogmatism subgroups.--The response-style differentiations between the Dogmatism subgroups are reported in Table 13. The High Dogmatism subgroup, like the Low Complexity subgroup, evidenced significant tendencies for greater usage of content, for more positive weighted-affect scores, and for more extreme weighted-affect scores with positive valence. The results for the Low Dogmatism subgroup were remarkably similar to those for the High Complexity subgroup. As with the Cognitive Complexity Index, the valence of extreme weighted-affect scores again suggests that High Dogmatism Ss were sensitized to certain content while Low Dogmatism gave more diverse affect responses at all levels of applicability.

While these results are consistent with many aspects of the theory of open and closed systems (Rokeach, 1960) they are not consistent with some others. With respect to the concept of cognitive differentiation, the results are generally consistent with theory (High Dogmatism Ss are sensitized to the perceive things which fit with their own viewpoint). Furthermore, the tendency to respond

TABLE 13

Response-Style Differences Between the Consumer-Product Perceptions of Dogmatism Subgroups

Personality Subgroups	Frequency of:				
	Greater Usage	More Positive Weighted-affect	More Extreme Weighted-affect	More Extreme Weighted-affect having	
				Positive Valence	Negative Valence
High Dogmatism Subgroup	61**	47*	28	25**	3
Low Dogmatism Subgroup	11	25	44	22	22
Total	72	72	72	72	

*Pr < .05, 2-tailed.

**Pr < .01, 2-tailed.

positively, only if content seems clearly applicable, suggests an intolerance of ambiguity among High Dogmatism Ss. These results were also remarkably similar to those for the Low Complexity subgroup.

On the whole, the response-style results again give strong support to Hypothesis 2. That is, personality characteristics appear to manifest themselves in the response-style characteristics of consumer-product perceptions. However, upon initial examination, some of the results do not appear to fit with the theory of Dogmatism. Specifically, there appears to be some inconsistency in the finding that High Dogmatism Ss expressed strong likes but not strong dislikes. Both the theory of open and closed systems and other research suggest that the belief and disbelief systems of High Dogmatism Ss are highly polarized and that both strong likes and strong dislikes should be expressed.

There are, however, several reasons for thinking that the present findings do not necessarily conflict with the position described above. One of these reasons derives from the theory of dogmatism itself and the others are based on characteristics of the Object Descriptions Task. Moreover, these factors may work together to yield the obtained differentiations.

1. While the theory of dogmatism describes high dogmatic persons as having systems which are less differentiated overall, belief and disbelief subsystems are described as being highly polarized (Rokeach, 1960). These ideas seem contradictory unless one defines differentiation in terms of the content used to describe

perceptions and one defines polarization in terms of differences in the intensity and valence of responses to associated content. Under these conditions, Ss could react to both liked and disliked objects in terms of the same content, yet perceptions of the two sets of objects could be sharply differentiated in terms of the intensity and valence of responses. The present results appear to support such an interpretation. High Dogmatic Ss tended to respond positively when attributes seemed clearly applicable and negatively when attributes seemed to apply only slightly. This trend could be observed in the bivariate distributions for High Dogmatic Ss while the distributions for low dogmatic evidenced greater diversity of valence over the different levels of applicability.

2. Assuming that High Dogmatism Ss are sensitized to context reflecting their own viewpoint and given the fact that most attributes selected for the Object Description Task were positive in form, it seems reasonable to expect such Ss to evidence weighted-affect scores which are more positive and greater numbers of extreme weighted-affect scores having positive valence. In other words, S characteristics and attribute characteristic combined to reveal differences between personality subgroups.

3. Assuming that High Dogmatic Ss also lack the flexibility to think of ideas that contrast with their own viewpoint (they tend to think of different shades of the same basic meanings), the trends mentioned above should be heightened. Correspondingly, assuming that Low Dogmatic Ss are more flexible, the differences between

subgroups should be maximized. That is, S characteristics and instrument characteristics seemed to work together to reveal substantial subgroup differences.

Orientation Inventory.--While this personality inventory focuses on cognitive content, the present model suggests that content differences may also be reflected in the organization of product-perceptions. Aside from this general speculation, the analyses were largely exploratory and results must be considered in relation to the results for the other inventories.

1. Characteristics of Orientation subgroups.--The contrasting subgroups used in the content differentiation analyses were also used for the response-style differentiations (see Characteristics of the Orientation subgroups, pp. 136-137, for a full description of these results).

2. Product perceptions of Orientation subgroups.--The response-style differentiations for the product perceptions of Orientation Inventory subgroups are presented in Tables 14 through 16. As with the content differentiations, response-style differentiation analyses were performed for all pairs of subgroups.

A comparison of the Interaction-Oriented subgroup with the Self-Oriented subgroup (see Table 14) revealed significant differences of several sorts. In particular, the Interaction-Oriented subgroup evidenced greater usage of content and weighted-affect scores which were more positive. The Self-Oriented subgroup, on

TABLE 14

Response-Style Differences Between the Consumer-Product Perceptions of Self-Oriented and Interaction-Oriented Subgroups

Personality Subgroups	Frequency of:				
	Greater Usage	More Positive Weighted-affect	More Extreme Weighted-affect	More Extreme Weighted-affect having	
				Positive Valence	Negative Valence
Interaction-Oriented Subgroup	60**	51**	36	19	17
Self-Oriented Subgroup	12	21	36	34**	2
Total	72	72	72	72	

*Pr < .05, 2-tailed.

**Pr < .01, 2-tailed.

the other hand, evidenced a strong tendency for extreme weighted-affect scores to be predominantly positive in form. In other words, each subgroup manifested some of the response-style characteristics of the Low Complexity and High Dogmatism subgroups, thereby making it somewhat difficult to interpret results. On the other hand, there were several reasons for thinking that these two "types" represented variations of a closed or simple system (e.g., given the triangular arrangement of intercluster distances, the complexity and dogmatism dimensions may very well cut across the triangle between Self-Orientation and Interaction-Orientation; content differentiation results also suggested that these orientation types deviate in different directions from low complexity and high dogmatism; although other investigators have found positive correlations between dogmatism and Self-Orientation, the correlations have not been high). In other words, the response-style results for the two "types" may have been similar for rather different reasons.

Compared with the Interaction-Oriented subgroup, the Task-Oriented subgroup evidenced significantly lower usage of content, fewer positive weighted-affect scores, fewer extreme weighted-affect scores, yet a strong tendency to respond negatively when extreme responses were given (see Table 15). As was the case with the content differentions for this subgroup, the response-style results were very similar to those obtained for the High Complexity and Low Dogmatism subgroups. The main difference was in the tendency for extreme reactions to be negative, but this does fit quite well with the content findings that the Task-Oriented subgroup seemed more

TABLE 15

Response-Style Differences Between the Consumer-Product Perceptions of Task-Oriented and Interaction-Oriented Subgroups

Personality Subgroups	Frequency of:				
	Greater Usage	More Positive Weighted-affect	More Extreme Weighted-affect	More Extreme Weighted-affect having	
				Positive Valence	Negative Valence
Interaction-Oriented Subgroup	65**	69**	47*	46**	1
Task Oriented Subgroup	7	3	25	2	23**
Total	72	72	72	72	

*Pr < .05, 2-tailed.

**Pr < .01, 2-tailed.

concerned with organization and reflected an intensity which was absent for the High Complexity and Low Dogmatism subgroups.

The comparison of response-style results for the Self-Oriented and Task-Oriented subgroups was also fairly easy to interpret (see Table 16). In other research, Self-Orientation has been found to correlate with high dogmatism, and Task-Orientation has been found to correlate with low dogmatism. The response-style results for these orientations were very much like those obtained for subgroups identified with the Cognitive Complexity Index and the Dogmatism Scale. The only exception was the tendency for Task-Oriented Ss to express extreme responses which were negative, which again supports the interpretation that Task-Oriented Ss were more concerned with organization and quality than were High Complexity and Low Dogmatism Ss.

Despite some ambiguity in how to interpret the comparison of Self-Oriented and Interaction-Oriented subgroups, the response-style results generally supported Hypothesis 2. Furthermore, it was possible to relate these results to those obtained for the Cognitive Complexity subgroups as well as for the Dogmatism subgroups. While this personality inventory dealt mainly with content, its implications for the organization of product perceptions were very similar to those for the inventories focusing on personality structure. That is, a personality characteristics was again found to manifest itself in the ways that people respond to objects.

Value Survey.--As with the Orientation Inventory, the Value Survey focuses on cognitive content. Since the present model

TABLE 16

Response-Style Differences Between the Consumer-Product Perceptions of Self-Oriented and Task-Oriented Subgroups

Personality Subgroups	Frequency of:				
	Greater Usage	More Positive Weighted-affect	More Extreme Weighted-affect	More Extreme Weighted-affect having	
				Positive Valence	Negative Valence
Self-Oriented Subgroup	51**	58**	43	37**	6
Task-Oriented Subgroup	21	14	29	5	20*
Total	72	72	72	72	

*Pr < .05, 2-tailed.

**Pr < .01, 2-tailed.

suggests that content and organizational differences at the personality level will be reflected in content and organizational differences in object perception, response-style differentiations were performed for this inventory as well.

1. Characteristics of Value subgroups.--The contrasting subgroups used in the content differentiation analyses were also used for the response-style differentiations (see Terminal Value configurations, pp. 145-149, and Instrumental Values configurations, pp. 152-155).

2. Product perceptions of Value subgroups.--The response-style differentiations for the product perceptions of Value Survey subgroups are presented in Tables 17 and 18. The first table shows the results for the contrasting Terminal Value subgroups. The second table gives results for the contrasting Instrumental Value subgroups.

Response-style differentiations for the Terminal Value subgroups were mixed and inconclusive (see Table 17). Subgroup 1 envidence a significant tendency to give more extreme weighted-affect scores. Subgroup 2 evidenced greater usage of attributes. In these and other respects, the results were much like those for the Interaction-Oriented and Self-Oriented subgroups, respectively (see Table 14). The mixed and inconclusive character of these response-style differentiations stands in contrast to the Value configuration (see Table 8) and the content differentiations (see Table 9) for these same subgroups. The values and the content characterizing

TABLE 17

Response-Style Differences Between the Consumer-Product Perceptions of Terminal Value Subgroups

Personality Subgroups	Frequency of:				
	Greater Usage	More Positive Weighted-affect	More Extreme Weighted-affect	More Extreme Weighted-affect having	
				Positive Valence	Negative Valence
Subgroup 1	26	37	46*	30	16
Subgroup 2	46*	35	26	19	17
Total	72	72	72	72	

*Pr < .05, 2-tailed.

TABLE 18

Response-Style Differences Between the Consumer-Product Perceptions of Instrumental Value Subgroups

Personality Subgroups	Frequency of:				
	Greater Usage	More Positive Weighted-affect	More Extreme Weighted-affect	More Extreme Weighted-affect having	
				Positive Valence	Negative Valence
Subgroup 1	49**	46**	50**	36**	14
Subgroup 2	23	26	22	12	10
Total	72	72	72	72	

**Pr < .01, 2-tailed.

Subgroup 1 suggest an extremely liberal concern with others while the values and content for Subgroups 2 suggest an extremely traditional viewpoint. In other words, it again appears that similar behavior may have manifested itself for rather different reasons. Both subgroups may have rather closed systems suggestive of left authoritarianism and right authoritarisnism, respectively.

For the Instrumental Value subgroups, the results were quite different. Subgroup 1, which may be described as open to new ideas and intensely independent (see the values in Table 10), was sharply differentiated from Subgroup 2, which may be described as open to warm personal relationships (see the values in Table 11). As indicated in the discussion of the value configurations, the difference between these subgroups may be characterized as tough-mindedness versus tender-mindedness, and the distinction appears to have manifested itself in the response-style results. There were significant subgroup differences for all four indices of response-style. Again, results support Hypothesis 2 that personality characteristics manifest themselves in the ways that people respond to objects.

Summary of Content and Response-Style Results

To show the extent that results for different personality subgroups relate to one another, content and response-style characteristics of consumer-product perceptions have been summarized and compared in some detail. Results for inventories concerned with cognitive structure have been examined separately from those

concerned with cognitive content. Nevertheless, comparisons across inventory type have been made under the assumption that structure and content are intimately related at the level of general cognitive characteristics as well as at the level of highly specific responses to objects.

Personality Inventories Concerned With Structure

The content and response-style results for Cognitive Complexity and Dogmatism subgroups are summarized in Table 19. In the case of content differentiation results, the summaries take the form of words and phrases which seem to characterize the configurations of content differentiators. The summaries of response-style differentiation results present mainly the statistically significant findings.

1. From the summaries of content differentiators reported in Table 19, it may be seen that there is a nearly perfect inverse alignment of Complexity subgroups with Dogmatism subgroups. Such an alignment suggests that the concept of structural differentiation may provide a parsimonious explanation of what these inventories measure.

In terms of the content presented in Table 19, the reader may see that content differentiators for the Low Complexity and High Dogmatism subgroups suggest that such persons are concerned with control, autonomy, quality, ascendency, amicability (socially accommodating), and a preference for regular, organized, traditional designs. In contrast to this, the content results for the High

TABLE 19

Summary of Content and Response-Style Results for Subgroups Identified Through Measures of Personality Structure

Low Complexity	**High Dogmatism**
Content Concerned with control, quality, autonomy, ascendancy, and social accommodation. Preference for traditional, regular, feminine, _____ styling.	Content Concerned with control, quality, autonomy, ascendancy, and social accommodation. Preference for traditional, regular, _____, symmetrical styling.
Response-style High usage of content. Weighted-affect scores with relatively positive valence. Extreme weighted-affect scores with predominantly positive valence.	Response-style High usage of content. Weighted-affect scores with relatively positive valence. Extreme weighted-affect scores with predominantly positive valence.
High Complexity	**Low Dogmatism**
Content Concerned with dynamism, flexibility, youthfulness, and openness to others. Preference for simple, lightly decorated, and modern styling.	Content Concerned with dynamism, flexibility, youthfulness, and openness to others. Preference for simple, lightly decorated, and modern styling.
Response-style Low usage of content. Weighted-affect scores with relatively negative valence. Extreme weighted-affect scores with a relatively even balance between positive and negative valence.	Response-style Low usage of content. Weighted-affect scores with relatively negative valence. Extreme weighted-affect scores with a relatively even balance between positive and negative valence.

Complexity and Low Dogmatism subgroups, indicated concern with flexibility, dynamism, youthfulness, casualness, and a preference for simple, modern styling. In other words, these differentiators suggest that the former subgroups have high needs for control over self and environment while the latter subgroups have high needs for flexibility and dynamism.

2. From the summary of response-style results, it may be seen that Complexity subgroups and Dogmatism subgroups again have a perfect inverse alignment. The concept of structural differentiation becomes even more tenable as an explanatory concept.

As shown in Table 19, the former subgroups differed in response-style characteristics from the latter ones in three ways (more usage of content, more weighted-affect scores with relatively positive valence, and a tendency for the more extreme weighted-affect scores to have positive valence). Modes of response evidenced by the subgroups representing low cognitive differentiation indicated narrowness in perceptions while modes of responses for the subgroups representing high differentiation suggested diversity in perceptions.

Despite the remarkable clarity of these results it is interesting to note that a cross-break of high and low scorers on the two inventories showed a very low correlation between the two variables. In fact, for each subgroup the majority obtained middle range scores on the other inventory (it was possible to have 40 different Ss involved in these 4 subgroups and 36 Ss were, in fact, different).

In sum, both the inventories concerned with personality tructure supported Hypotheses 1 and 2. That is, contrasting ersonality subgroups differed in terms of the content used to escribe perceptions of sterling tableware and in terms of modes of esponse to the products. These results, therefore, suggest that eneral structural characteristics have implications for both the ontent and organization of more specific behavior such as responses o sterling silver tableware. Furthermore, it appears that the oncept of cognitive differentiation (or openness of a cognitive ystem) constitutes an excellent concept for interpreting: (1) elationships among the subgroups identified by means of the nventories concerned with personality structure (Cognitive Complexity ndex and Dogmatism Scale), and (2) similarities and differences mong the content and response-style characteristics of the consumer-roduct perceptions for these subgroups. In other words, results ere consistent with theory underlying these inventories and they rovided a rather good picture of connections between personality haracteristics and silverware perception.

Cognitive Versus Physical Complexity.--Before leaving this iscussion of relationships between personality structure (i.e., ognitive Complexity Index and Dogmatism Scale) and consumer-product erceptions, it is also important to examine the question of elationships beweeen cognitive differentiation and preference for hysical complexity. Specifically, it is necessary to ask: (1) hat are the defining characteristics of physical complexity, and (2) hether cognitive complexity is isomorphic with physical complexity.

In a review of research related to cognitive complexity, Bieri (1966) speculated that the "sets" to perceive diversity or regularity in one's social environment may be akin to preferences for artistic complexity or simplicity as described by Barron (1952, 1953). According to Barron, preference for complex designs is a preference for unstable, disordered, irregular, asymmetrical, and non-traditional designs. In contrast to this, preference for simplicity was defined as a preference for stable, pedictable, balanced, symmetrical, and traditional designs. In other words, Barron's findings suggest that simplicity-complexity is defined more by the manner in which motif is handled than by the quantity or elaborateness of the decoration. In sum, simplicity-complexity is defined by the more abstract qualities of a design rather than the particular time period in which a motif has its origins.

The present research also provided some evidence regarding the nature of the relationship between cognitive complexity and physical complexity. The most direct evidence derived from the content differentiation results. Other evidence derived from the response-style differentiations.

1. Content differentiators for the Cognitive Complexity and Dogmatism subgroups indicated that sterling silverware was perceived very much as described by Barron. The salient content for the High Complexity and Low Dogmatism subgroups indicated preference for objects that seemed spontaneous, unrestrained, innovative, controversial, simple, light, and futuristic. In contrast to this, differentiators for Low Complexity and High Dogmatism subgroups

included preference for objects which seemed secure, reserved, individualistic balanced, skilled, geometrical, symmetrical, historical, and heavy.

2. The response-style results for these two personality inventories revealed that High Complexity and Low Dogmatism Ss had differentiated (or diverse) perceptions of objects, while the Low Complexity and High Dogmatism Ss had relatively undifferentiated perceptions.

In brief, the present findings suggest that the "sets" to perceive diversity or regularity in one's social environment and the openness or closedness of cognitive systems are related to the ways that objects are perceived and to the physical appearance of objects which are preferred. These results support: (1) speculations (Bieri and Blacker, 1956; Bieri, 1966) regarding relationships between the general and the specific, (2) Barron's (1952) findings that the ways in which motif is handled, rather than the quantity of motif, constitute the defining characteristics of simplicity-complexity, and (3) Barron's (1952) findings that people who preferred "complex" designs described themselves on a group Adjective Check-List as loud, unstable, emotional, and demanding while people who preferred "simple" designs described themselves as gentle, contented, conservative, serious, and individualistic.

Despite the consistency of these results, a note of caution must be expressed. Specifically, one must be careful about the sorts of designs which are described as "simple" or "complex." Both Barron's findings and the present findings indicate that the manner

in which motif is handled must not be confused with the quantity of decorative motif. While traditional designs generally have greater quantities of decoration than modern designs, regularity in the handling of motif generally causes the former to be "simple" and the latter to be "complex." If one fails to take the distinction between physical complexity and physical elaborateness into account, one could easily make decisions which were directly contradictory to the results of the present research.

It should also be noted that these trends do not preclude the possibility that modern designs which are regular, symmetrical, and balanced may also arouse rather complex meanings through symbolism derived from social experiences. To the extent that this situation prevails, it is possible that more heavily decorated designs will meet the defining characteristics of "complex" designs as style trends change. In other words, the inverse relationship between simplicity-complexity and traditional-modern may simply be an artifact of style trends and the social symbolism of design elements at a particular point in time.

Personality Inventories Concerned With Content

The content and response-style characteristics of consumer-product perceptions were more difficult to summarize for subgroups identified through the use of personality variables concerned with cognitive content (i.e., Orientation Inventory and Value Survey). While the subgroups associated with cognitive structure variables could be aligned rather well in terms of cognitive differentiation,

neither this concept nor any other appeared to provide a simple interpretation of results for content subgroups. This situation may, to some extent, be expected since such inventories deal with a wide variety of content rather than focusing on a single dimension as was the case with the inventories concerned with structure.

Orientation Inventory.--Summaries of comparisons among the Self-Oriented, Interaction-Oriented, and Task-Oriented subgroups are presented in Table 20. The alignments of these subgroups in the table were made with reference to the structural results. Given the clarity of results for inventories concerned with structure, it was hoped that the Orientation Inventory results could be viewed from somewhat the same perspective.

When compared with the Task-Oriented subgroup, the content and response-style results for both the Interaction-Oriented and Self-Oriented subgroups were much like those for the Low Complexity and High Dogmatism subgroups. These orientation subgroups (see Table 20) evidenced concern with amicability, appeared to prefer feminine and traditional design, and evidenced response-style characteristics which were virtually identical to those for the Low Complexity and High Dogmatism subgroups. Likewise, the content and response-style results for the Task-Oriented subgroup were similar to results for the High Complexity and Low Dogmatism subgroups. The Task-Oriented subgroup was concerned with flexibility and dognamism, and response-style results indicated low usage of content; however, the other response-style results suggested a more intense and

TABLE 20

Summary of Content and Response-Style Results for Orientation Inventory Subgroups

Self-Oriented (mixed results) **Content** Concerned with social accommodation, personal impulsiveness, autonomy, control over environment. Preference for elaborate, _____, organized, traditional, _____ styling. **Response-style** Low usage of content. _____. Weighted-affect scores with relatively negative valance. _____. Extreme weighted-affect scores with predominantly positive valence.	**Interaction-Oriented** (mixed results) **Content** Concerned with social accommodation, _____, _____, _____, _____. Preference for _____, feminine, _____, _____, _____, light styling. **Response-style** _____. High usage of content. _____. Weighted-affect scores with relatively positive valence. Extreme weighted-affect scores with predominantly positive valence.	**Self-Oriented** (minor trends) **Content** Concerned with social accommodation, personal impulsiveness, _____, _____. Preference for elaborate, feminine, _____, _____, _____ styling. **Response-style** _____. High usage of content. _____. Weighted-affect scores with relatively positive valence. Extreme weighted-affect scores with predominantly positive valence.
Interaction-Oriented (mixed results) **Content** Concerned with dynamism, _____, _____, _____, _____, openness to others, casualness. Preference for _____, _____, _____, casual, light, modern styling **Response-style** _____. High usage of content. _____. Weighted-affect scores with relatively positive valence. _____. Extreme weighted-affect scores with an even balance of positive and negative valence.	**Task-Oriented** **Content** Concerned with dynamism, flexibility of ideas, ascendancy, control of self and environment, autonomy, _____, _____. Preference for formal, traditional, organized, _____, _____, _____ styling **Response-style** Low usage of content. _____. Weighted-affect scores with relatively negative valence. _____. Extreme weighted-affect scores with predominantly negative valence. _____.	**Task-Oriented** (minor trends) **Content** Concerned with dynamism, flexibility of ideas, ascendancy, control of self and environment, _____, _____. Preference for formal, traditional, _____, _____, _____, _____ styling **Response-style** Low usage of content. _____. Weighted-affect scores with relatively negative valence. _____. Extreme weighted-affect scores with predominantly negative valence. _____.

critical viewpoint than that indicated by the High Complexity and Low Dogmatism results.

The comparisons discussed thus far might well be interpreted in terms of cognitive differentiation--with the Interaction-Oriented and Self-Oriented subgroups representing undifferentiated systems and the Task-Oriented subgroup representing a differentiated system. Support for this interpretation derives from the fact that Interaction-Orientation has been found (Bass, 1962, 1967) to correlate with need for affilation and group dependence, Self-Orientation has been found to correlate with insecurity, sensitivity, excitability, immaturity, and high dogmatism, and Task-Orientation has correlated with seriousness, objectivity, tenseness, and low dogmatism.

In other respects, the orientation types represented viewpoints which differed somewhat from those evidenced for the complexity and dogmatism variables. The content results for the Interaction-Oriented subgroup evidenced a degree of concern with dependent social relationships which was not evident for either the Low Complexity or High Dogmatism subgroups. Content results for the Self-Oriented subgroup suggested an impulsiveness and lack of control over oneself which also differed from the Low Complexity and High Dogmatism subgroups. For the Interaction-Oriented subgroup, it appeared that high need for control over self was replaced by concern with stable social relationships. For the Self-Oriented subgroup, need for control was replaced by impulsiveness. That is, the Self-Oriented and Interaction-Oriented subgroups appeared to represent two different variations of the same basic syndrome. This interpretation was

supported by the comparison of the Self-Oriented and Interaction-Oriented subgroups (except for concern with impulsiveness versus amicability, both content and response-style results were mixed).

Similarly the Task-Oriented results suggested a seriousness, cautiousness, intensity, and need for control over oneself which was not characteristic of the High Complexity and Low Dogmatism subgroups. This difference was reflected in concern with such matters as confidence, refinement, restraint, and preference for geometrical, modern design. The response-style results also reflected this difference in the fact that extreme weighted-affect scores had predominantly negative, rather than balanced, valence. In brief, the results for this subgroup suggest a high need for control over self yet there is an intensity accompanying a concern with new ideas that is not characteristic of High Complexity or Low Dogmatism. It seems reasonable, therefore, to characterize the orientation as rational and disciplined flexibility.

On the whole, the content and response-style results supported the hypothesis that personality characteristics would manifest themselves in consumer-product perceptions. While results summarized in the previous section supported the hypothesis with respect to cognitive structure variables, the present results supported the hypothesis with respect to cognitive content variables as well. In addition, the Orientation results help to fill out a broader picture of relationships among personality inventories, wherein the Orientation types represented slight variations on subgroup differences which could be interpreted partly in terms of cognitive openness or

differentiation. In sum, these personality types were found: (1) to have implications for both the content and structure of consumer-product perceptions, and (2) to have much in common with results obtained for personality variables concerned with personality structure.

Value Survey.--Personality types identified by means of the Value Survey appeared to represent several rather different orientations. While perceptual results were generally consistent with the characteristics of each type, these results could not easily be organized in terms of a single explanatory concept such as cognitive differentiation.

1. Terminal Values.--The value configuration for Terminal Values Subgroup 1 (Peace, Equality, Freedom) suggested a viewpoint which was open, liberal, and other-oriented in an idealistic rather than interaction-oriented sense. The value configuration for Terminal Values Subgroup 2 (Salvation, Mature Love, Self-Respect) suggested a conservative, traditional, and self-oriented value system.

As shown in Table 21, the content differentiators for Subgroup 1 included concern with flexibility, dynamism, and youthfulness, but the response-style results were mixed and inconclusive. The content differentiators for Subgroup 2 included concern with control, quality, socially accommodating amicability, and preference for regularity and traditionalism in design, but the response-style results were again inconclusive.

TABLE 21

Summary of Content and Response-Style Results
for Value Survey Subgroups

Terminal Values (Subgroup 2)	Instrumental Values (Subgroup 1)
(Salvation, Mature Love, Self-Respect--conservative, traditional social values, and self-oriented)	(Intellecutal, Independent, Courageous--idea-oriented, action-oriented, and tough-minded)
Content Concerned with quality, control of environment, casualness and personal impulsiveness, social assommocation, _____, and _____. Preference for balanced, symmetrical, traditional, feminine, _____ styling.	Content Concerned with quality, control of environment, _____ _____, _____ _____, dynamism, and flexibility. Preference for _____ _____, _____, _____, modern styling. (ambiguous style preferences)
Response-style High usage of content. _____ _____. _____ _____ _____. Extreme weighted-affect scores with an even balance of positive and negative valence.	Response-style High usage of content. Weighted-affect scores with relatively positive valence. Extreme weighted-affect scores with predominantly positive valence. _____ _____ _____ _____.

TABLE 21

Continued

Terminal Values (Subgroup 1)	Instrumental Values (Subgroup 2)
(Peace, Equality, Freedom--active, humanistic, other-orientation)	(Forgiving, Cheerful, Helpful--passive tender-minded, other-orientation)
Content Concerned with youthfulness, control of self, _____ _____, dynamism, flexibility. Preference for simple, modern styling.	Content Concerned with youthfulness, control of self, openness to others, _____, _____. Preference for simple, ____ styling. (ambiguous results)
Response-style Low usage of content. _____ _____. Weighted-affect scores which are relatively extreme. _____ _____. _____ _____ _____ _____. _____.	Response-style Low usage of content. Weighted-affect scores with relatively negative valence. _____ _____. Weighted-affect scores which are not relatively extreme. Extreme weighted-affect scores with an even balance of positive and negative valence.

On the whole, the content results for the Terminal Values subgroups seemed consistent with the value syndromes which defined these subgroups as well as with content results for subgroups bearing theoretical relationships with these value syndromes. In particular, the content results for Subgroup 1 constituted a variation on those obtained for the High Complexity and Low Dogmatism subgroups as well as for the Task-Oriented subgroup of the Orientation Inventory. Correspondingly, content results for Subgroup 2 resembled the results for the Low Complexity, High Dogmatism, and Self-Oriented subgroups. The results differed from those mentioned above in that Subgroup 1 appeared to reflect a more extreme liberal position and Subgroup 2 appeared to reflect a more conservative position. In other words, the former may be closer to left authoritarianism while the latter may represent right authoritarianism. If this characterization is true, it may very well account for the inconclusive response-style results. While the concept of cognitive differentiation clearly facilitates interpretation, it is not sufficient for explanation.

2. Instrumental Values.--The value configuration for Instrumental Values Subgroup 1 (Intellectual, Independent, Courageous) represented a viewpoint which might be characterized as idea-oriented and tough-minded. On the other hand, the configuration for Instrumental Values Subgroup 2 (Forgiving, Cheerful, Helpful) represented a rather passive, interaction-oriented, or tender-minded viewpoint. Unlike results for the personality subgroups discussed

thus far, the results for these subgroups departed substantially from general trends.

The summaries in Table 21 indicate that Subgroup 1 was concerned with flexibility and dynamism, but was also concerned with quality, seriousness, security, and low control over self. The results suggest an unstable viewpoint characterized by an intense, almost compulsive, achievement-orientation. While the content results resembled different aspects of the results for several other subgroups, the response-style results were virtually identical to those obtained for the Low Complexity, High Dogmatism, and Self-Oriented subgroups. To obtain a consistent interpretation of these results, the subgroup's perceptions must be regarded as undifferentiated but for rather different reasons from what was the case for the Low Complexity, High Dogmatism, and Self-Oriented subgroups.

In contrast to this, the content and response-style results for Subgroup 2 gave a rather different impression. The salient content suggested an interaction-orientation combined with some concern for youthfulness and lack of restraint. While these content results were somewhat ambiguously aligned with other subgroups, response-style results were virtually identical to those obtained for High Complexity, Low Dogmatism, and Task-Oriented subgroups. Taken together the content and response-style results suggest an openness to others on an emotional level but not an openness to new ideas.

Structural Differentiations

As with the content and response-style differentiations, the general objective of the structural differentiations was to study relationships between personality characteristics and consumer-product perceptions. This time, however, the analyses were concerned with structural characteristics of these perceptions.

The two general hypotheses guiding this portion of the research are given below.

Hypotheses 3; Contrasting personality types may be differentiated in terms of structural characteristics of the meaning-systems underlying object perceptions.

The implications of this hypothesis and of those derived from it (see Group-Composite Differentiations, pp. 204-214) are that: (1) persons with personality characteristics "in common" (i.e., the members of personality "types") will tend to perceive objects similarly (i.e., perceptions of sterling silver tableware), (2) the perceptual commonalities of contrasting personality "types" will have rather different structural properties, and (3) structural characteristics will make psychological sense when viewed in relation to the personality "type" for which they are obtained.

Hypothesis 4: People vary in the extent to which they use the same content to describe their likes as compared with their dislikes, and this variation reflects differences in personality characteristics.

The implications of this hypotheses and the one derived from it (see Individual Differentiations, pp. 214-217) are that: (1) the consumer-product perceptions of each person may be viewed as responses to two different groups of objects (i.e., objects liked versus objects disliked), (2) each person's responses to the group of objects liked may be analyzed separately from responses to objects disliked, and (3) for the members of some personality types, the structure of the system underlying liked objects will be more like the structure underlying disliked objects than will be the case for other personality types.

The scope of the structural analyses was restricted to personality inventories concerned with structure (i.e., Cognitive Complexity Index and Dogmatism Scale). Although it was also expected that structural differentiations might be detected for personality inventories concerned with content, the analyses were too expensive to be conducted for all four inventories.

Review of Structural Differentiation Procedures

The structural differentiation analyses were of two broad sorts: (1) analyses based on the perceptual commonalities of personality subgroups, and (2) analyses of variations in the structural characteristics of perceptions for individuals. The first sort made some novel uses of factor analytic results; the second extended the use of clustering methods to the behavior of single individuals but at the level of analyzing an entire system.

Group-Composite Differentiations.--For the group-composite analyses of perceptual commonalities, Object Descriptions Task data for the two 10-S Cognitive Complexity subgroups and the two 10-S Dogmatism subgroups (see Chapter III, Classificatory Analyses) were analyzed. The 72 by 72 attribute interassociation matrices formed for each subgroup (see Chapter III, Distance Matrices) were transformed to similarity matrices, factor analyzed, and 10-factor varimax rotations were performed. For purposes of testing the stability of results, the same analyses were also performed for 20-S Cognitive Complexity and 20-S Dogmatism subgroups.

Although a few of the Ss in each of the Complexity subgroups were also in one or the other Dogmatism subgroup, there was very little evidence of an overall correlation between these two variables. For the 10-S subgroups, only one tenth of the Ss were the same and the majority of extreme scorers on one variable were middle range scorers on the other variable. For the 20-S subgroups, approximately one fifth of the Ss were the same, but again the majority of extreme scorers on one variable were middle range scorers on the other and there was no particular pattern to the relationship between the variables when extreme scorer subgroups were compared. While this evidence suggested that the correlation between these variables is low, the purpose of these analyses was to test whether a typological approach could detect stable, but opposite, tends for Cognitive Complexity and Dogmatism subgroups.

In addition, the Object Descriptions Task data for each individual in the 20-S Dogmatism subgroups were divided into responses

to the nine objects which a S liked most and responses to the nine objects liked least (Object Evaluation Task data were used for this purpose). Attribute interassociation matrices (72 by 72) were formed for both of the 20-S personality subgroups. These matrices were transformed to similarity matrices and factor analyses were performed (two through ten factors were submitted to varimax rotations).

For the purpose of these analyses, structural "differentiation" was conceptualized as the ability to think of ideas which contrasted with given attributes and the ability to use these meanings in rather different ways for different objects. It was expected that, under conditions of high "differentiation," attributes and contrasting ideas would tend to be widely separated in perceptual hyperspace. Structural "differentiation" was, therefore, operationally defined as the number of pairs of attributes and contrasting ideas having highest loadings (but with the opposite sign) on the same factor. The Object Descriptions Task provided the necessary flexibility for this sort of measurement since contrasting ideas were defined by Ss in terms of their own frames of reference.

The rotational solutions were summarized by counting the number of times that attributes and their contrasting ideas had highest loadings on the same factor in a 10-factor varimax solution (dimensional usage count). The statistical significance of the count for each subgroup was evaluated with an exact binomial test, and the significance of the difference between the dimensional usage counts for different groups was tested with the normal approximation to the binomial (see the section on Structural Differentiations in Chapter III).

The two through 10-factor rotational solutions, for matrices based on the 9 objects liked most and the 9 objects liked least by individual Ss in the 20-S Dogmatism subgroups, were summarized in terms of: (1) dimensional usage counts for 10-factor solutions, (2) the largest proportion of dimensional usage counts found in a single factor (2, 6, and 10-factor solutions were considered), (3) the proportion of variance accounted for by different numbers of factors (2, 3, and 4 respectively), and (4) the number of factors rotated before there were fewer than six highest loadings on a single factor. The results of analysis 1 were evaluated statistically (binomial tests of dimensional usage), but only trends could be examined for analyses 2 through 4 because of the small number of comparisons involved.

The steps of the group-composite analyses are summarized in Figure 12. As with the other differentiation analyses, the flowchart presents the steps for two groups but may be extended to situations involving more than two groups.

Individual Differentiations.--For the individual analyses, a 36 by 36 attribute interassociation matrix was formed for each individual in the two Dogmatism subgroups. Only the 36 attributes listed in the booklets for the Object Descriptions Task were used in forming these matrices. Two such matrices were formed for each individual--one matrix for responses to the 9 objects which the S liked most and one matrix for responses to the 9 objects liked least. The resulting matrices were analyzed using the L.A.W.S. hierarchical clustering method, and the similarity between the pair

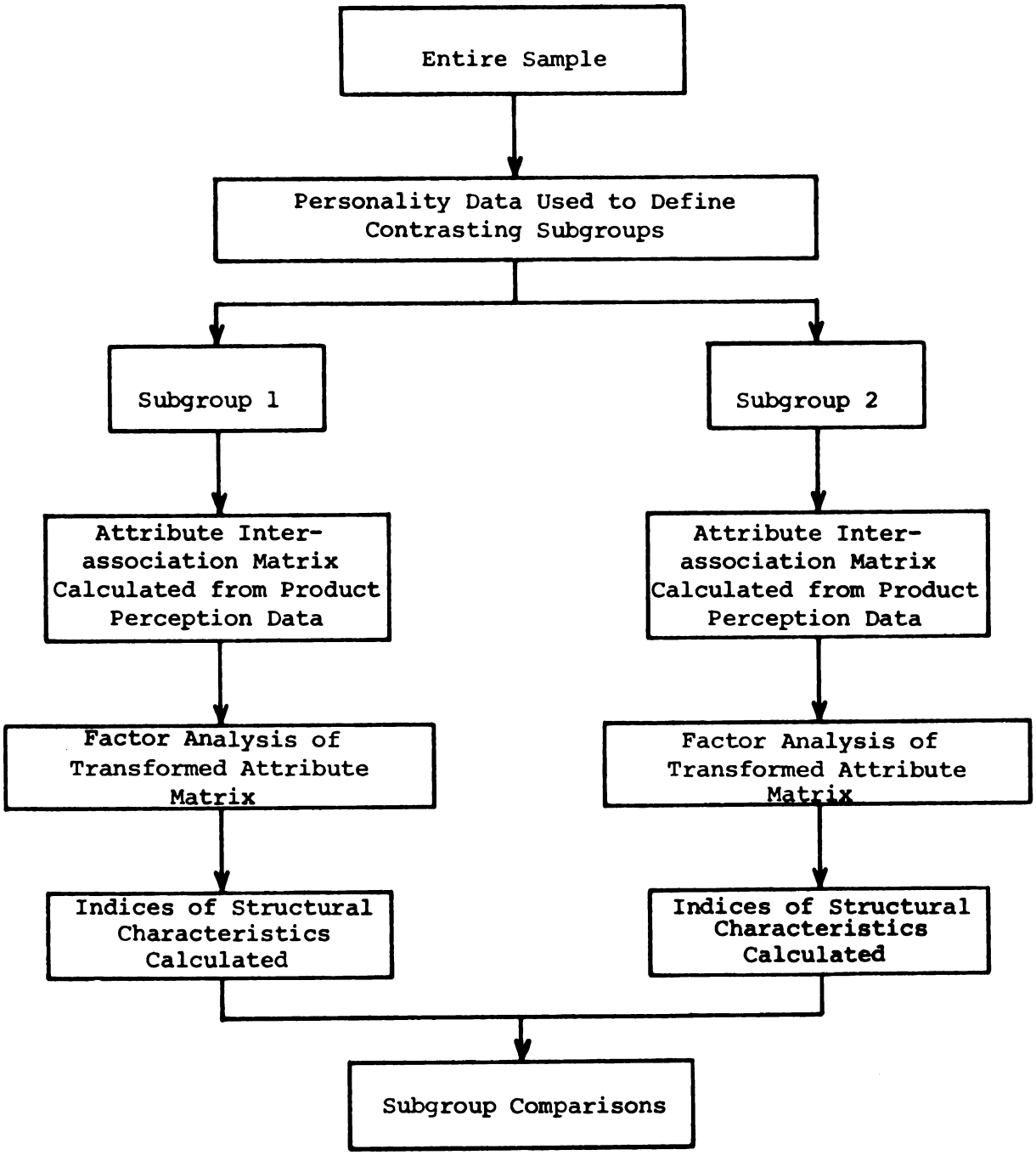

Figure 12. A Flowchart for Group-Composite Structural Differentiations Between the Consumer-Product Perceptions of Contrasting Subgroups.

of hierarchies for each individual was calculated with a new method for comparing the overall similarity of hierarchical systems. Finally, the distributions of similarity values for contrasting personality subgroups were compared, and the statistical significance of subgroup differences was evaluated with a Mann-Whitney U test.

The steps of the individual analyses are summarized in Figure 13. It should be noted that these same procedures may also be followed for the members of more than two groups.

Results of Structural Differentiation Analyses

As mentioned earlier, there were two types of structural differentiation analyses: (1) analyses of perceptual commonalities among the members of contrasting personality subgroups (group-composite differentiations), and (2) analyses concerned with structural variation within the cognitive system of each separate member of a personality "type" (individual differentiations).

Although the particular data collection and analysis methods employed here were new, the general variety of analysis has been employed by other researchers. For example, the analyses were sufficiently like Talbott's (1968) efforts to differentiate between persons with open and closed systems and make differentiations within such systems that they may be viewed as alternative approaches to replicating portions of his research. The analyses also bore a resemblance to some of Osgood's (1962) content and structure analyses of grouped perceptual data.

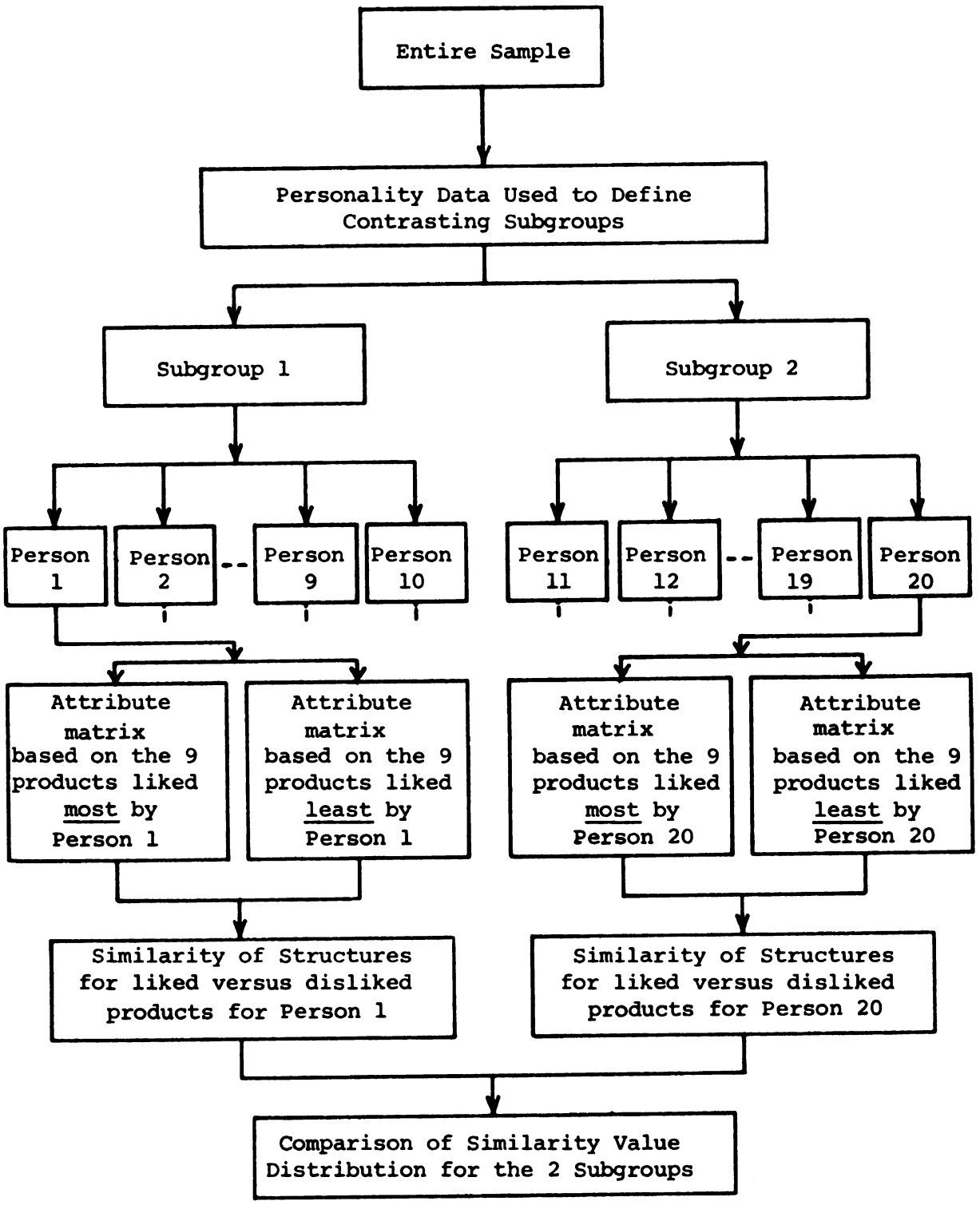

Figure 13. A Flowchart for Individual Structural Differentiations Between the Consumer-Product Perceptions of Contrasting Subgroups.

Group-Composite Differentiations.--For the group-composite differentiations, the factor analyses for contrasting personality subgroups dealt with: (1) general system characteristics, and (2) within-system characteristics.

1. General system characteristics.--The hypotheses tested here were based on a theory of cognitive complexity (Bieri, 1961, 1966) and the theory of open and closed systems (Rokeach, 1960).

According to Bieri, the cognitive property of simplicity-complexity represents something about a person's structuring of his social world. More specifically, cognitive complexity reflects the relative differentiation of a person's system of dimensions (or personal constructs) for perceiving his environment. Persons with complex systems are thought to use different combinations of constructs and levels of constructs when perceiving different role-persons or other stimuli. Cognitively simple persons, on the other hand, are thought to use constructs in a parallel fashion when describing different role persons or stimuli. The present research has attempted to obtain evidence as the whether this general property can manifest itself in the structural characteristics of consumer-product perceptions.

Hypothesis 3a: Persons who are cognitively complex have more differentiated object perceptions than persons who are cognitively simple.

While research with a variety of stimuli has offered some support for the idea that cognitively complex persons use more dimensions when perceiving stimuli in their environment, there has

been rather little research relating cognitive complexity to the perception of everyday objects. Some research by Welsh (1949), Barron (1952, 1953), Christensen (1960), has explored relationships between personality characteristics and preference for complex drawings, but relationships between cognitive complexity and consumer-product perceptions have not been explored.

A parallel hypothesis derives from Rokeach's theory of open and closed systems.

> Hypothesis 3b: When people have open systems, the meaning-systems underlying their perceptions of objects will be more differentiated than when they have closed systems.

Rokeach has theorized and found supporting evidence that persons with closed systems (high dogmatics) tend to avoid contact with persons and ideas that disagree with their own beliefs, to accept entire sets of beliefs as a package, to be rather opinionated, and to screen out or distort information to make it fit a narrowly defined viewpoint. Rokeach has described this situation as low cognitive differentiation. To the extent that Bieri and Rokeach are describing the same cognitive property, the implications for the structural characteristics of object perceptions should be very similar.

The hypotheses, that cognitive openness and cognitive complexity are both directly related to the structural differentiation of object perceptions, were strongly supported. Table 22 shows the extent to which dimensional usage summaries of factor analyses for contrasting personality subgroups indicated that

TABLE 22

Dimensional Usage Differences Between the Consumer-Product Perceptions of Cognitive Complexity and Dogmatism Subgroups

(Number of attributes and contrasting ideas having highest loadings on the same factor)

Subgroup Sizes	Cognitive Complexity Subgroups		Difference
	High Complexity	Low Complexity	
The 10 most extreme Ss	10**[A]	6	4
The 20 most extreme Ss	15**[A]	7	8**[B]

Subgroup Sizes	Dogmatism Subgroups		Difference
	Low Dogmatism	High Dogmatism	
The 10 most extreme Ss	20**[A]	4	16**[B]
The 20 most extreme Ss	19**[A]	5	14**[B]

**[A] = $p < .01$, (one-tailed exact binomial test with N = 36 and p = 1/10).

**[B] = $p < .01$, (one-tailed normal approximation to the binomial, N = 36 and P = 1/10).

attributes and contrasting ideas were being defined as "opposites" (attribute matrices for 10-S, as well as for 20-S, contrasting subgroups were factor analyzed, 10-factor varimax rotations were performed, and dimensional usage counts were made).

The magnitude of dimensional usage of attributes and contrasting ideas for High Cognitive Complexity and Low Dogmatism subgroups was significant beyond the .01 level in all four analyses (the exact binomial probability of obtaining nine or more pairs of meanings with highest loadings on the same factor is less than .01). For the Low Cognitive Complexity and High Dogmatism subgroups, the amount of dimensional usage was insignificant in all cases.

The differences between contrasting personality subgroups were in the expected direction, and three of the four differences were significant beyond the .01 level (one-tailed test for differences between frequencies). The difference between Low and High Dogmatism subgroups was significant beyond the .01 level for both the 10-S and the 20-S groups, the different between High and Low Cognitive Complexity subgroups was significant beyond the .01 level for the 20-S subgroups, and the .05 level was approached for the 10-S subgroups.

These results appear consistent with Rokeach's (1960) ideas that cognitive differentiation manifests itself in the richness and variety of detail associated with different objects. They also appear consistent with Bieri's (1966) ideas that there are more dimensions of perception for complex systems. In sum, the results strongly suggest that both stable and substantial commonalities can

be detected in the perceptions of persons having similar personality characteristics. Moreover, the concept of cognitive differentiation appears to be an excellent explantory concept.

2. Within-system characteristics.--In addition to theorizing about the general characteristics of open and closed systems, Rokeach (1960) has discussed the relative differentiation of belief and disbelief subsystems for persons with open or closed systems. Specifically, Rokeach has theorized that: (1) belief subsystems are more differentiated than disbelief subsystems for both sorts of persons, (2) disbelief subsystems (and, by inference, belief subsystems) for persons with open systems are more differentiated than disbelief subsystems (and belief subsystems) for persons with closed systems, and (3) there is relatively little difference in the differentiation of belief and disbelief subsystems for persons with open systems and relatively greater difference for persons with closed systems.

Assuming, as Talbott (1968) did, that the perceptions for liked and disliked objects constitute reasonable operationalizations of belief and disbelief subsystems, the following hypotheses were tested.

Hypothesis 3c: Cognitive systems underlying the perception of liked objects are more highly differentiated than the systems underlying disliked objects.

Hypothesis 3d: The cognitive systems underlying the perception of both liked and disliked objects are more highly differentiated for persons with open than with closed systems.

Hypothesis 3e: The relative difference in differentiation between the subsystems underlying liked and disliked objects is greater for persons with closed systems than for persons with open systems.

Hypothesis 3c, which refers to the differentiation of the subsystems for liked and for disliked objects, was partially supported by the results reported in Table 23. For the Low Dogmatism subgroup, the difference in differentiation was significant beyond the .05 level, and for the High Dogmatism subgroup the difference was in the expected direction. Hypothesis 3d was strongly supported. The Low Dogmatism subgroup had more differentiated perceptions of both liked and disliked objects (both differences were significant beyond the .01 level). The findings related to 3e, relative differentiation, were inconclusive. In terms of absolute difference in differentiation, the results were counter to expectation; in terms of a percentage difference they indicated support for the hypothesis.

The results in support of Hypothesis 3c were generally consistent with Talbott's (1968) findings that perceptions of disliked objects are less differentiated than the perceptions of liked objects. Where the present findings clearly supported Hypothesis 3d, Talbott's findings were inconclusive, and results for Hypothesis 3e were inconclusive as was also the case in Talbott's research.

Hypotheses 3c, 3d, and 3e were also examined through the use of an index reflecting the extent to which dimensional usage was concentrated in a single factor (largest proportion of dimensional usage located in one factor). The idea behind this index was that

TABLE 23

Dimensional Usage Differences Between the Perception of Products Liked and Products Disliked by Dogmatism Subgroups

(Number of attributes and contrasting ideas having highest loadings on the same factor)

Cognitive Subsystems	Dogmatism Subgroups		Difference
	Low	High	
Objects Liked	23**[A]	4	19**[B]
Objects Disliked	18**[A]	2	16**[B]
Difference	5*[B]	2	

**[A] = $P < .01$ (one-tailed exact binomal test with $N = 36$ and $P = 1/10$).

**[B] = $P < .01$ (one-tailed normal approximation to the binomal, $N = 36$ and $P = 1/10$).

*[B] = $P < .05$ (as above).

dimensional usage would be more heavily concentrated when cognitive systems were undifferentiated (e.g., closed rather than open, and disbeliefs rather than beliefs).

The largest proportions of dimensional usage concentrated in one factor was calculated for rotational solutions of 2, 6, and 10 factors. Although the small number of comparisons prohibits making a statistical test, the results reported in Table 24 generally support Hypothesis 3c and 3d but are again inconclusive for Hypothesis 3e. For both liked and disliked objects, the proportions of concentration were, with one exception, lower for the Low

TABLE 24

Other Dimensional Usage Differences Between the Perception of Products Liked and Products Disliked by Dogmatism Subgroups

Personality Subgroups	Number of Factors Rotated	Largest Proportion of Dimensional Usage Concentrated in a Single Factor	
		Objects Liked	Objects Disliked
Low Dogmatism	2	.56	.60
	6	.26	.32
	10	.30	.39
High Dogmatism	2	.83	.55
	6	.50	.67
	10	.50	.50

Dogmatism subgroup than for the High Dogmatism subgroup. For the Low Dogmatism subgroup, dimensional concentration was greater for disliked objects than it is for liked objects (the trends were split for the High Dogmatism subgroup). Furthermore, given the relatively low amount of dimensional usage for the High Dogmatism subgroup, efforts to examine differences in proportions would seem unwarranted and the status of Hypothesis 3e remains unclear.

Finally, Hypothesis 3c, 3d, and 3e were examined using operationalizations of structural differentiation that Talbott (1968) had employed (number of factor rotated prior to satisfying a rotational criterion, and proportion of variance accounted for by factors). Since the present analyses were group-composite rather

than individual analyses such as Talbott performed, the rather small number of comparisons prohibit making statistical tests but trends could be examined.

The findings reported in Table 25, although only trends, appear to contradict both Talbott's findings and the other findings of the present structural analyses. With reference to Hypothesis 3c, the indices of differentiation used by Talbott suggest greater differentiation for disliked rather than liked objects. The number of factors rotated before a factor had less than six highest loadings and the proportions of variance accounted for by given numbers of factors appeared to indicate slightly greater "differentiation" for disliked than for liked objects. Similarly, results pertaining to Hypothesis 3d indicated that the High Dogmatism subgroup had greater differentiation for both liked and disliked objects than was the case for the Low Dogmatism subgroup. The results of Hypothesis 3e were again inconclusive.

In interpreting the fact that use of the same indices yielded a major discrepancy between the present findings and Talbott's findings, it must be noted that two fundamentally different instruments were used to gather perceptual data (Object Descriptions Task versus Semantic Differential). The technique used here allowed Ss to define contrasting ideas in terms of their own frames of reference while in Talbott's research Ss were presented with bipolar "opposites." To the extent that some Ss define contrasting ideas which are not "opposites" to the attributes presented, a factor analysis of these data should yield a large number of minor

TABLE 25

Other Indices of Structural Differentiation Between the Perception of Products Liked and Products Disliked by Dogmatism Subgroups

Personality Subgroups	Other Operationalizations of Within-Group "Differentiation"		Objects Liked	Objects Disliked
Low Dogmatism	Factors rotated before the number of highest loadings fell below 6		5	5
	Proportion of variance accounted for	2 factors	.24	.22
		3 factors	.30	.29
		4 factors	.35	.34
High Dogmatism	Factors rotated before the number of highest loadings fell below 6		6	7
	Proportion of variance accounted for	2 factors	.22	.19
		3 factors	.27	.25
		4 factors	.31	.30

factors. Where the opposites are already presented, as in a Semantic Differential, the sorts of individuals described above should exhibit restricted patterns of behavior and factor analyses should yield fewer factors that account for greater proportions of variance.

On the whole, the present results provided strong support for Hypothesis 3 and two of the three hypotheses derived from it. Moreover, it appeared that failure to support Hypothesis 3e was mainly due to insufficient depth of information. In other words, structural personality characteristics manifested themselves in the structure of consumer-product perceptions.

Individual Differentiations.--While the group-composite differentiations dealt with the organization underlying the perceptual commonalities of subgroups, these analyses were performed for individuals.

The hypothesis tested here derived from Hypothesis 4 in that it focuses upon within-person variability and does not require that the members of a personality type use similar content in describing their reactions to objects.

> Hypothesis 4a: For persons with closed systems, the organization of content underlying objects liked has greater similarity to the organization underlying objects disliked than is the case for persons with open systems.

To test this hypothesis it was necessary to: (1) gather responses to liked and disliked objects from each member of each personality type, and (2) calculate the similarity between the systems underlying liked and disliked objects.

Hypothesis 4a also derived from Rokeach's (1960) theory of open and closed systems. In particular, Rokeach has described the systems of closed-minded persons as having low differentiation and being characterized by stereotype, premature closure, and cognitive narrowing. Theory underlying the construction of the Object Description Task implies that closed-minded persons will tend to use a rather narrow range of content and tend to perceive objects in terms of the relative presence or absence of desired content. That is, closed-minded Ss will tend to use about the same content to describe liked and disliked objects and will respond positively if the desired trait is present in sufficient degree and negatively if it is not. On the other hand, open-minded individuals are more likely to describe liked objects with a wide variety of content and disliked objects with a wide variety of rather different content. Different objects may be liked or disliked for a wide variety of reasons.

As mentioned earlier, clustering analyses of Object Descriptions Task data were performed for each individual's responses to objects liked and to objects disliked, and the similarity of the two hierarchies was calculated. The results of the similarity analyses are reported in Table 26, and they show that the hypothesis was supported. The two distributions of similarity values are significantly different (obtained Mann-Whitney U = 16; critical value is 19 for $M_1 = M_2 = 10$ and $p \leq .01$).

These results provide a supplement to the group-composite analyses because they illustrate that broad structural properties

TABLE 26

Structural Similarity of Systems Underlying the Perception of Products Liked and Products Disliked

(Distribution of Similarity Values for Individual Members of the Dogmatism Subgroups)

Similarity Value	Low Dogmatism Subgroup	High Dogmatism Subgroup
85		
84		
83		2
82		
81		
80		
79		
78		
77	1	1
76	1	
75		1
74	1	1
73		2
72		2
71	1	1
70		
69	1	
68	1	
67	2	
66		
65		
64		
63		
62		
61		
60		
59		
58		
57	1	
56		
55		
54	1	
53		
52		
51		
50		

Mann-Whitney U = 16; $p \leq .01$ of $U < 19$.

can be identified at either the group or individual level. The results also appear to extend Talbott's (1968) findings. While Talbott failed to find evidence of differences between open- and closed-minded persons in regard to structural differentiation, the present findings indicated that open and closed-minded persons differed in the relationship between perceptions of liked and disliked objects. In other words, broad structural analyses of a single individual's perceptions of liked and disliked objects can be used to differentiate among individuals. More specifically, the results indicated that personality characteristics were related to individual differences in cognitive mappings for sterling silver tableware.

Summary of Structural Differentiation Results

The purpose of the structural differentiation analyses was to examine relationships between variables concerned with personality structure, on the one hand, and indices reflecting the structure of consumer-product perception, on the other hand.

The structural differentiation analyses dealt with: (1) commonalities in the product perceptions of contrasting personality subgroups (group-composite differentiations), and (2) within-person variations which might distinguish between the product perceptions of contrasting personality subgroups (individual differentiations). These analyses attempted to go beyond the content and response-style analyses by focusing on very broad characteristics of cognitive

systems. Simultaneously, however, these analyses sought stable structural characteristics in the responses of single individuals.

Group-Composite Differentiations.--The structural results of the group-composite differentiations may be summarized as follows.

1. For both the High Cognitive Complexity and Low Dogmatism subgroups, dimensional usage of attributes and contrasting ideas (highest loadings on the same factor) was significantly greater than it was for the Low Cognitive Complexity and High Dogmatism subgroups. These results supported Hypotheses 3a and 3b that persons with open systems and persons with cognitively complex systems will have more differentiated object perceptions.

Further, these results suggest that High Cognitive Complexity and Low Dogmatism Ss tended to think of contrasting ideas which were, in fact, "opposites" of the attributes presented in the Object Descriptions Task. Correspondingly, the results for Low Cognitive Complexity and High Dogmatism Ss suggest that they are far less flexible in their use of descriptors. Instead, such persons responded to attributes and contrasting ideas as if they constituted slightly different shades of the same basic idea rather than "opposites."

2. When responses to liked objects were analyzed separately from responses to disliked objects, several significant differences were obtained. First, there was evidence that perceptions of liked objects were more differentiated than perceptions of disliked objects for both Dogmatism subgroups. In addition, the Low Dogmatism subgroup evidenced more differentiated perceptions than the High

Dogmatism subgroup for both liked and disliked objects. Minor trends regarding the relative differentiation of perceptual subsystems were completely inconclusive. In other words, Hypothesis 3c was partially supported for both personality subgroups, Hypothesis 3d was strongly supported for both sets of objects, but the results for Hypothesis 3e were inconclusive.

Assuming that the present definition of dimensional usage (i.e., attribute and contrasting idea having highest loading on the same factor) constitutes a realistic operationalization of cognitive differentiation, the concept of cognitive differentiation provides an interpretation of differences between contrasting personality subgroups and of relationships between cognitive complexity and dogmatism. As defined in the theory of cognitive complexity (Bieri, 1961, 1966) and as used by Rokeach (1960), the concept of cognitive differentiation suggests that high complexity and low dogmatism should be aligned and vice versa. Furthermore, assuming that perceptions of liked and disliked objects are related to what Rokeach calls belief and disbelief systems, the concept of differentiation also provides an explanatory concept for the within-system differences obtained.

In evaluating the stability and generality of the group-composite results, it must be remembered that the success of the analyses was heavily dependent upon within-group commonalities in both the content and organization of perceptions. Talbott (1968) has argued that individual differences in the content used to describe objects tend to obscure structural properties when a group-composite

analysis is attempted. Specifically, Talbott suggested that structural analyses should focus on how each individual structures his own system internally and should not be tied to group commonalities. To the extent that this argument is valid, it would appear that the Object Descriptions Task yielded data which facilitated very sensitive analyses of within-group commonalities.

Since most tests of the hypotheses derived from Hypothesis 3 were supported, support for Hypothesis 3 was clearly substantial. As a result, it may be argued that personality variables concerned with structural characteristics have an impact upon the structural characteristics of consumer-product perceptions and that the impact is similar for all members of given personality "types."

Individual Differentiations.--The results of the structural differentiation analyses for individuals in contrasting personality subgroups were also quite encouraging.

For persons with closed systems, the organization of content underlying liked objects was more like the organization underlying disliked objects than was the case for persons with open systems. Hypothesis 4a was supported.

These results suggest that persons with relatively closed systems (High Dogmatism Ss) distinguish between liked and disliked objects in terms of a rather narrow range of cognitions. More specifically, likes and dislikes seem to be differentiated mainly in terms of the valence attached to perceiving the presence or absence of salient content. Persons with open systems (Low Dogmatism Ss),

on the other hand, appear to describe different objects in different ways and do not rely as heavily on valence as a means of distinguishing among likes and dislikes. In other words, the concept of cognitive differentiation provides a consistent interpretation of these results, as well as of the group-composite results.

The speculations discussed above were also supported by trends in the response-style results. In particular, the evidence of more usage and more positive weighted-affect scores suggests that Low Complexity and High Dogmatism Ss are: (1) sensitized to use certain content, and (2) likely to respond positively when preferred content is perceived to apply and negatively when it does not seem to apply sufficiently. Finally, it should be noted that the results are consistent with the fact that group-composite differentiations for the Dogmatism subgroups indicated that Low Dogmatism Ss were quite flexible in their use of content to describe likes and dislikes while High Dogmatism Ss were far less flexible.

The individual differentiations did not depend on within-group commonalities, yet the findings were closely related to those obtained for group-composite differentiations. Consequently, they suggest that the commonality assumption was reasonable. Furthermore, the individual differentiation results indicate that within-person variability (perception of likes versus dislikes) can be utilized as a means of differentiating between personality types at a broad structural level.

On the whole, the structural differentiation results for Cognitive Complexity and Dogmatism subgroups provided a well-integrated and logical picture of relationships between personality variables and consumer-product perceptions. Group-composite differentiations supported the hypotheses that both Cognitive Complexity and Dogmatism subgroups would evidence different degrees of perceptual differentiation. In addition, separate analyses of responses to liked and disliked objects supported the hypotheses that: (1) the system underlying liked objects was more differentiated than the system underlying disliked objects, and (2) responses to both sets of objects were less differentiated for persons with closed systems than for persons with open systems. Finally, individual-by-individual analyses of responses to liked and disliked objects supported the hypothesis that persons with open systems perceived objects in terms of rather diverse content categories, while persons with closed systems had less differentiated perceptual categories for liked and disliked objects.

In sum, the concept of cognitive differentiation provided a parsimonious interpretation of differences between the structural results for contrasting personality subgroups, and the results were consistent with theory underlying the personality inventories employed. That is, the structural differentiation analyses indicated that structural properties of personality can manifest themselves in structural properties of consumer-product perceptions.

CHAPTER V

CONCLUSIONS, SUPPORTING RESULTS, AND IMPLICATIONS FOR FURTHER RESEARCH

Since the present research yielded results pertaining to the understanding and measurement of many different aspects of cognitive functioning, there are many possible ways of summarizing results and presenting conclusions. The approach adopted here was to: (1) state sets of conclusions having theoretical, methodological, and practical import, and (2) accompany these conclusions with summaries of supporting results. The chapter concludes with implications for future research.

Theoretical Conclusions

The theoretical conclusions in the following two sections concern: (1) relationships between personality variables (as general cognitive characteristics) and sterling silverware perceptions (as more specific cognitive characteristics), and (2) indirect support for the model of complex perceptual-cognitive processes originally developed in Chapter II. In both instances, conclusions are presented in order of increasing generality.

Personality Characteristics and Consumer-Product Perceptions

A number of conclusions concerning relationships between relatively general personality characteristics and relatively specific consumer-product perceptions followed from the content, response-style, and structural differentiation analyses.

1. People may be grouped according to their personality characteristics, and these groupings may be described as personality "types."

    a. For each of the personality inventories used in the present research, it was possible to form groups of Ss for whom within-group similarity was relatively high and between-group similarity was relatively low.

2. The members of personality "types" have substantial commonalities in their perceptions of certain consumer products.

    a. Group-composite analyses of consumer-product perceptions (i.e., sterling silver tableware) indicated that the members of personality "types" have substantial commonalities in the content, response-style, and structural characteristics of their perceptions.

    b. Structural analyses of the cognitive systems underlying perceptions of liked and disliked objects indicated that the members of the same personality "type" had cognitive subsystems with similar organization.

3. General cognitive properties (e.g., personality characteristics) are related to more specific cognitive properties (e.g., consumer-product perceptions).

   a. For each of several personality variables, differences between contrasting personality "types" were reflected in perceptions of sterling silver tableware. The hypotheses concerning the content and organizational characteristics of product perceptions were supported for most comparisons of contrasting personality "types." These analyses were performed under the assumption that different levels of cognitive functioning are dynamically interrelated.

4. Different varieties of relationships between general and specific cognitive properties are coordinated with one another.

   a. For each of several personality variables, content, response-style, and structural differentiations between contrasting personality "types" were well-integrated with one another. The main exceptions were the personality "types" that were not clearly distinguished by the personality data (i.e., certain Orientation Inventory subgroups and the Terminal Value subgroups).

5. Theoretical and empirical similarities among general cognitive properties are reflected in similarities among more specific cognitive properties.

a. Similarities among personality "types" were reflected in similarities among the content and organizational characteristics of sterling silverware perceptions. Overall, the results yielded a broad and rather consistent picture of cognitive dynamics. For example, the concept of cognitive differentiation provided a parsimonious interpretation of content, response-style, and structural results for contrasting Cognitive Complexity subgroups and contrasting Dogmatism subgroups. Results for several of the inventories were also consistent with the findings of other research.

6. Content and structure are interdependent aspects of cognitive functioning. That is, the meanings comprising a cognitive system and the organization of these meanings are dynamically interdependent.

   a. Personality variables concerned with content and personality variables concerned with structure were found to be related to both the content and organization of sterling silverware perceptions.

   b. Since the concept of cognitive differentiation constitutes a parsimonious explanatory concept for the structural results, the use of this concept to explain content and response-style results gains greater credibility.

7. People project themselves into their perceptions of certain consumer products.

   a. Each of the hypotheses tested in this research was replicated for several different personality "types," and results obtained for several different levels of cognitive functioning (content, response-style, and structure) supported these hypotheses.

8. On the whole, the findings of the present research provide strong support for the idea that personality characteristics and perceptions of everyday objects can be shown to be related to one another. This conclusion stands in direct contrast to the fact that research in this area has seldom confirmed such relationships.

   a. In marketing and consumer research, for example, personality characteristics have often been used to classify people so that consumer behavior such as perceptions, products, and purchases could be predicted. Many researchers have worked in this area (see Engel, 1968; Kollat, et al., 1970; Holloway, et al., 1971), and a considerable variety of personality inventories and products have been employed. Unfortunately, rather few studies have accounted for much variance in product data and many have yielded contradictory results. On the other hand, some researchers suggest that the difficulty may lie in the failure to consider the complex nature

of the variables involved. The present research was also based on the assumption that the problem was primarily methodological. Results supported this contention.

b. Results suggested that requiring respondents to express large amounts of perceptual detail may be a necessary condition for successful analyses of cognitive systems. Typal commonalities found in the perception of everyday objects have seldom been as pervasive as those found in the present research. Generally, researchers have treated product perceptions as rather simple phenomena, with the result that oversimplified data collection and analysis methods may very well have obscured stable but complex relationships between different regions of cognitive functioning.

Indirect Support for the Model of Complex Perceptual-Cognitive Processes

Since a number of the methods developed for the present research constituted efforts to operationalize portions of the present model of complex perceptual-cognitive processes (see Chapter II), hypothesis tests utilizing these methods had implications for the validity of the model itself.

Conclusions pertaining to the model are discussed below.

1. Several lines of evidence supported the idea that an elementary cognitive subsystem is a symbolic meaning having strength of association and valence components. In other words, results

support the idea that these components constitute the so-called "cognitive" and "affective" dimensions of perceptions.

a. The salient content yielded by content analyses could only be interpreted by taking the valence of this content into account. In other words, the evaluative components of responses provided information which was not contained in strength of association responses alone.

b. Response-style results also supported the existence of strength of association and valance components. In particular, personality "types" differed in the manner in which these components were related to one another.

c. Structural results indicated that "types" differed in how important valence was to the perception of liked and disliked objects.

2. Relationships between elementary cognitive subsystems may be realistically calculated as described in the model.

a. Both content and structural analyses were based on attribute interassociation matrices. The fact that these results were relatively easy to interpret gave indirect support to the distance model of relationships among elementary cognitive subsystems.

3. The organization of cognitive objects may be abstracted from masses of perceptual detail.

a. Both content and structural analyses used multidimensional method to analyze attribute interassociation matrices. If sterling silverware perceptions had not had a strong underlying organization, the analyses would certainly have failed.

4. The existence of a cognitive system encompassing a variety of cognitive objects was supported in several ways.

   a. In the present model, the cognitive representations for personality characteristics and sterling silverware perceptions are viewed as different cognitive objects (i.e., a cognitive object is defined as a constellation of elementary cognitive subsystems). Relationships between a rather abstract object (personality) and a rather concrete object (tableware) were identified for several different personality variables, thereby increasing the confidence that cognitive objects may be regarded as different regions of a more general cognitive system.

   b. Several kinds of relationships between personality characteristics and consumer-product perceptions were identified. For the most part, personality "types" were differentiated in terms of the content, response-style, and structural characteristics of sterling silverware perceptions. The fact that typal differences extended across several levels of cognitive functioning further

increased confidence that a general cognitive system was being measured.

c. For given personality variables, the different kinds of relationships between personality and silverware perceptions were coordinated with one another. Moreover, the kinds of relationships observed for some personality variables recurred for theoretically similar personality variables. Again, results gave confidence that a broad underlying system was involved.

5. The concept of a multiple cognitive system also appears viable, provided that the concept is used in a typological context.

   a. Nearly all of the content, response-style, and structural analyses were heavily dependent upon perceptual commonalities among the members of individual personality "types." In the absence of perceptual commonalities, the content, response-style, and structural results should have been largely random. In the absence of perceptual commonalities, the analyses could not have provided evidence pertaining to elementary cognitive subsystems, relationships among these subsystems, the nature of cognitive objects, and the organization of cognitive systems.

6. On the whole, the results supported the present model as a realistic representation of an aspect of cognitive functioning.

   a. The typological approach caused the model to be tested under severe conditions. Behavior patterns, which might have held only for individuals, had to manifest themselves in the perceptual commonalities of personality "types."

   b. While support for the model was indirect, there were numerous lines of evidence supporting the basic concepts of the model and others supporting its more abstract aspects.

   c. Given the depth of information provided by the data collection and data analysis methods based on the present model, the model may very well possess advantages over the alternative models discussed in Chapter II. Existing models are seldom as comprehensive as the present one, and they are seldom supported as well as the present model was supported.

   d. If these conclusions regarding the present model are valid, the model clearly adds some important concepts to theoretical analyses of cognitive functioning. For example, the model implies that: (1) cognitive systems may be viewed as constellations of cognitive objects, (2) relationships between objects may be fruitfully regarded as relationships between "clouds" of cognitive

elements, (3) cognitive elements may be fruitfully viewed as dimensional subsystems, and (4) the dimensions of these subsystems constitute strength of association and valence of association with an object. While a few models bearing a resemblance to the present model were discussed in Chapter II, none of these give the integrated and multilevel view of cognitive functioning provided by the present model.

Methodological Conclusions

In large part, the present research was based on the assumption that the essential character of perceptual-cognitive phenomena will be obscured unless object perceptions are studied as regions within a broad cognitive system. To this end, a number of data collection and data analysis methods were developed as operationalizations of the present model of complex perceptual-cognitive systems, and the research constituted an effort to examine the utility of these methods.

Both the model and the methods developed for this research were based on the general assumption that social and cognitive phenomena are inherently complex and that methods must be capable of handling complexities without imposing unnecessary or unrealistic constraints. Data collection techniques which oversimplify phenomena are likely to yield unrealistic information. Data analysis methods which impose unnecessary statistical constraints are likely to distort or simply miss the fundamental characteristics of the phenomena involved. In other words, the gains to be achieved

through realistically measuring the complexities of perceptual-cognitive phenomena may be greater than the gains to be achieved through simplification and statistical elegance.

The possibility of being able to state any conclusions related to these methods was entirely dependent upon support for the research hypotheses. If results had failed to support the hypotheses, it would have been impossible to know whether the model and hypotheses were unrealistic, whether the operationalizations were inappropriate, or whether the analysis methods were insensitive to the phenomena under consideration. Fortunately, hypotheses were generally supported by the data and conclusions may be drawn.

On the whole, the findings of the present research suggest that meager results from research dealing with similar problems may derive from: (1) univariate or low-dimensional approaches to complex problems, (2) deficiencies in techniques for collecting complex product-perception data, and (3) analysis methods being better suited to low-dimensional metric data than to multivariate data meeting rather few measurement assumptions.

Data Collection

The primary data collection technique developed for the present research was the Object Descriptions Task. The technique was based on an operationalization of the concept of an elementary cognitive subsystem (see Chapter II), and in some respects the research was a test of the utility of this operationalization.

While the Object Descriptions Task was new in several respects, it also represented an alternative to the Semantic

Differential and attempted to improve upon that technique. In particular, the Object Descriptions Task sought to avoid many of the measurement and statistical constraints imposed by the Semantic Differential.

1. The Object Descriptions Task encouraged people to respond on the basis of first impressions. They were not required to summarize their own introspective processes.

    a. Respondents were not asked to express global reactions to objects. Instead, they were asked to express strength of association and degree of liking responses for a wide range of content. While research (Osgood, et al., 1957, Osgood, 1962) has shown that some evaluation is associated with each content dimension, the Semantic Differential merely obtains evaluative responses toward objects as a whole.

    b. In contrast to what respondents must do in the Semantic Differential, this task did not require respondents to organize their impressions in terms of semantic dimensions. Instead, they responded to single attributes rather than bipolar dimensions. The fact that respondents were capable of giving the masses of responses required by the present use of the Object Descriptions Task suggests that it may be relatively natural to perform the task.

2. The Object Descriptions Task was very sensitive to individual differences in cognitive habits (e.g., perceived content, content perceived to contrast with other content, response intensity, response valence, relationships between intensity and valence). None of the individual difference characteristics described below are provided by the Semantic Differential.

   a. The technique allowed respondents to differ in the ways that they related applicability (strength of association) and liking (valence) responses (both content and response-style results indicated that weighted-affect scores did provide an important means of differentiating between personality "types").

   b. Respondents were free to use as many or as few attributes and contrasting ideas as they wished (the response-style results indicated again that this freedom provided an excellent means from a research point of view of differentiating between "types").

   c. Respondents were free to define ideas that contrasted with listed attributes in terms of their own frames of reference, whereas the Semantic Differential restricts respondents to the use of normatively defined "opposites." As before, from a research viewpoint, group-composite analyses of structure then showed that many people think in terms of discrete attributes rather than dimensions.

In fact, individual differences in dimensional definition of contrasting ideas were sufficiently linked with personality characteristics to differentiate between the perceptions of contrasting personality types.

3. Despite the fact that the Object Descriptions Task was sensitive to complex phenomena, it is relatively easy to construct such an instrument.

   a. Rather little attention needs to be given to the sort of content used. Both denotative and connotative attributes may be used since valence responses make almost any content useful. For denotative attributes, the researcher is provided with a means of knowing something about the affective significance of a response. For connotative attributes, the necessity of making potentially unwarranted assumptions about perceived meanings is reduced.

   b. Construction of an Object Descriptions Task is not dependent upon normative or comparative judgments nor is it dependent upon item-test correlations. The individual, rather than the group, is the point of reference, and perceptual similarities are not preconditions to using certain content in an instrument. As a result, the technique encourages the identification of individual differences, and much of the content eliminated by traditional attitude scaling techniques and by the search for bipolar opposites for the Semantic

Differential should be useful in an Object Descriptions Instrument.

4. While the Object Descriptions Task appears capable of pushing direct questioning to its limits, the techniques may be used to collect either small or large quantities of perceptual-cognitive data.

   a. As employed in the present research, the task pushed many respondents to the limits of their endurance; yet, results showed that respondents were capable of giving meaningful responses at very rapid rates and for an extended period of time.

   b. Since a respondent's task is the same for each object, far less demanding tasks can be set for respondents depending upon the purposes of the research. Large quantities of data were collected here in order that the full capabilities of the technique might be examined.

5. On the whole, the Object Descriptions Task has avoided a variety of constraints and limitations while simultaneously achieving greater sensitivity to perceptual-cognitive phenomena.

   a. By giving direct, rather than inferential, attention to the evaluative significance of associations, the technique essentially provided a means of meshing the measurement of associations with the measurement of attitudes. Several recent attitude theories suggest

that attitude should be conceptualized and measured in terms of the strength and valence of individual associations with objects. Attitude has often been defined as having cognitive and affective components, and, in a recent redefinition of attitude, Rokeach (1968, pp. 109-132) has argued for the interdependence of these aspects of attitude. Other theorists, such as Rhine (1958) and Fishbein (1967a), also regard content and approach-avoidance associations as supplementing one another. Yet, as Fishbein (1967b) has pointed out, virtually all existing attitude measurement techniques focus exclusively on approach-avoidance reactions to an object. This fact is particularly apparent for the Semantic Differential where attitude has been equated with the evaluation factor.

b. Through its sensitivity to individual differences, the technique has considerable potential for differentiating among people who differ both in degree and in kind. While the technique is an objective approach to measurement, it has many characteristics found only in open-ended projective techniques (e.g., respondent as the point of reference, freedom in the use of content, freedom to use applicability and valence ratings in a wide variety of ways, and others).

c. Since the same applicability and liking scales are used for each attribute, the technique facilitates data

analysis by eliminating the troublesome problem of scale reflection.

d. The present model also suggests that Object Descriptions Task data may be used to obtain more accurate estimates of attitude. For example, weighted-affect scores for salient associations might be combined to form an attitude score toward an object. Assuming that people are able to give reliable evaluative responses to individual associations prior to being able to reliably evaluate the object as a whole, a researcher should be able to predict the attitude position at which a person will eventually arrive.

Data Analysis

While the Object Descriptions Task avoided many restrictions and limitations found in other measurement techniques, the burden of summarizing the masses of associations yielded by this technique fell heavily upon the analytic methods developed for this research.

1. The typological approach used in the present research established conditions for identifying potentially nonlinear characteristics in the perceptions of given personality "types."

   a. The typological approach assumed that people with similar personality characteristics could be grouped together and treated as a "type." That is, the approach attempted to strike a balance between the specific and the general.

The approach was neither so individualized that it prohibited generalization nor so broad that within-group similarities were compelled to be superficial.

b. For the most part, analyses supported the idea that the members of personality "types" have similar consumer-product perceptions and that the perceptions for "types" can be realistically mapped. In other words, the typological approach to analyzing product perceptions was supported by typal commonalities.

2. Methods developed for analyzing the consumer-product perceptions of separate personality "types" took advantage of the conditions established by the typological approach.

   a. As a result of analyzing each "type" separately, the analyses identified the predominant content, response-style, and structural characteristics of consumer-product perceptions for individual "types." By analyzing within-group characteristics independently of between-group characteristics, the possibilities for identifying non-linear characteristics were improved.

   b. As a result of analyzing each "type" separately, it was possible to use multivariate methods which could not have been used if within-group and between-group relationships had been considered simultaneously. For example, the formation of attribute interassociation matrices, hierarchical clustering analyses and factor

analyses of these matrices, bivariate response-distribution analyses for separate attributes, comparisons of cognitive subsystems, and others would have been ruled out.

c. While the writer had not applied the L.A.W.S. hierarchical clustering method (Price, 1969) to any practical problems prior to the present research, its usefulness has been tested with a wide variety of matrices having known structural properties. Furthermore, during the period of time that the present research was in progress, the clustering method was successfully used in typologically oriented marketing research (Anderson, 1971). Also, the L.A.W.S. clustering method has a number of characteristics which recommend it over rather similar methods developed by McQuitty (e.g., 1963, 1966b, 1966c, 1971) and by Johnson (1967).

d. The methods for analyzing response-style characteristics of types were developed especially for the present research. While the indices used were new, they were in keeping with theory and research concerned with response-style, and they sought to summarize the response-style commonalities of persons belonging to particular types.

e. While the structural analyses of consumer-product perceptions did not constitute a new research strategy, the methods employed were new. Because of the nature of the Object Descriptions Task, it was possible to summarize

factor analytic results in some unusual ways. Moreover, a new method for comparing hierarchical systems (Price, 1970) was applied to the problem of examining intra-person variation in cognitive subsystems.

3. Methods developed for differentiating between the predominant product perceptions of different personality "types" identified both linear and nonlinear typal differences.

   a. The typal differentiation methods were sensitive to complexities in the content, response-style, and structural characteristics of product perceptions for different "types."

   b. Most of these methods used the predominant commonalities of different "types" as data and were operationally independent of analyses performed to separate "types."

   c. Since the differentiation analyses dealt with the predominant characteristics of each "type," results should be rather stable. If within-group and between-group characteristics had been considered simultaneously, methods would more likely have capitalized on chance relationships.

   d. Unlike multiple discriminant analysis, which yields linear combinations of variables that maximize differences among groups, the present methods yielded mainly configurations of perceptual differences. The results

were summarized in rather simple ways, and nonparamatric statistical tests were applied where appropriate.

4. Analysis methods need not be statistically elegant to be powerful tools for social scientists. What methods lose in statistical elegance may be offset by gains resulting from realistically matching the complexity and uniqueness of the phenomena being studied.

   a. While the methods for analyzing typal structure and typal differences were procedurally complex, they imposed very few statistical constraints. Within-type analyses did not require data stronger than interval-level measurement, and between-type analyses were either qualitative in form or worked with nominal or ordinal level differences (see Chapter III for a full discussion of the advantages and disadvantages of existing differentiation methods).

   b. Statistically reliable differences between personality "types" were obtained for several different levels of cognitive functioning (i.e., content, response-style, and structural characteristics).

   c. Results provided strong support for the argument that relatively weak statistical tests can be used to test for typal differences yielded by multivariate methods which do not impose many statistical constraints.

5. "Types" can be differentiated on a one-to-one basis. That is, "types" can be differentiated without giving direct consideration to the individual members of these "types."

   a. Most of the hypotheses tested in this research involved comparisons of information derived from the perceptual commonalities for each "type."

   b. The success of the differentiation analyses was heavily dependent upon the existence of substantial perceptual commonalities, and results strongly suggested that these commonalities existed for personality "types."

   c. Results also suggested that one need not gather data from large numbers of respondents, provided that the population "types" under consideration are represented by sufficient numbers of respondents to allow generalization.

6. Abstract cognitive properties of cognitive systems can be studied at the individual level. That is, given adequate perceptual-cognitive data, it is possible to examine broad structural characteristics of an individual's cognitive subsystems.

   a. For each member of two different personality "types," the hierarchical system underlying objects liked was compared with the system underlying objects disliked, and the "types" were found to differ in the magnitude of this relationship.

b. Results supported the use of multidimensional methods with data obtained from single individuals and suggested that such methods can even be sensitive to within-person variations in cognitive organization.

c. A number of years ago, Cronbach (1958) pointed out that there was considerable need for methods capable of focusing on individuals and differentiating among them in terms of system organization. Efforts to accomplish these objectives have been made by Osgood, et al. (1957), Stephenson (1953), and others. The present methods constituted an effort to extend the variety of methods appropriate to the problem of studying individuals.

7. On the whole, it may be concluded that analysis methods developed for the present research were well-suited to the problems of examining complex phenomena.

a. While the methods imposed rather few statistical constraints, they were sensitive to the complexities of cognitive phenomena and were capable of revealing statistically reliable differences between personality types.

b. The results indirectly supported the argument that some of the methods constituted reasonably realistic operationalizations of portions of the present model. For example, attribute interassociation matrices mapped relationships among elementary cognitive subsystems, the

hierarchical clustering method developed for this research yielded mappings of the meaning-systems underlying consumer-product perceptions, and the method for comparing hierarchical systems mapped relationships between cognitive subsystems.

c. A novel use of factor analytic results indicated that, in the context of data yielded by the Object Descriptions Task, a simple and statistically reliable index of structural differentiation may be obtained.

d. Response-style analyses showed that the form of the elementary cognitive subsystem varied from one "type" to another.

e. While the results have not, thus far, been discussed in the context of cross-validation (or replication), it must also be emphasized that the present research strategy has much in common with multi-trait multi-method cross-validation procedures (Campbell and Fiske, 1959). In particular, relationships with consumer-product perceptions were demonstrated for several different personality characteristics, and these relationships pertained to several different aspects of consumer-product perceptions (i.e., content, response-style, and structural characteristics). In addition, the stability of structural characteristics was examined by performing analyses for persons obtaining the 20 highest and the 20 lowest Dogmatism scores as well as for those

obtaining the 10 highest and 10 lowest. On the whole, results indicated that the methodology was not highly dependent upon the use of the most extreme groups.

f. Although the analysis methods were capable of revealing a broad variety of typal differences, it must be emphasized that these analyses depended a great deal on the sensitivity of the data collection techniques developed for the research.

8. Before leaving this discussion of methodology, it must be reemphasized that without computers most of the data collection and analysis would have been unfeasible. The findings of the present research also suggest that further development of this sort of research is heavily dependent upon the development of more sophisticated computer uses.

a. Through the use of computers, massive quantities of multivariate data collected in the Object Descriptions Task could be compressed to the point where relatively simple, yet highly sensitive, analyses of configural characteristics and typological differences could be made.

b. The degree to which hypotheses were supported by the data suggests that complex problems should not be approached with simplified methods. Instead, it may be most fruitful to impose very few constraints on data collection and then utilize the capabilities of a computer to organize and condense data to the point were simple properties may be revealed.

c. By using the computer to compare and manipulate data, the researcher is given a freer hand to collect large amounts of data. The computer should not simply be used as a glorified desk calculator but as an "assistant" responsible for many aspects of the research process.

d. Since the computer could be used to process large quantities of data and perform complex analyses, the writer was encouraged to develop both theory and methods which faced up to the potential complexities of cognitive phenomena.

Practical Conclusions

It will be recalled that the major objectives of the present research were theoretical and methodological. Nevertheless, a number of practical conclusions can be teased out from the research findings. Some of these conclusions derive from results relating to theory, some derive from methodological results, and still others pertain to the versatility of the model and methods for dealing with a broad variety of consumer behavior questions.

1. It should be possible to identify relationships between other personality characteristics and other consumer products.

   a. Despite the meager nature of results from past investigations, relationships identified here were strong and pertained to two different classes of personality inventories (content and structure inventories). Provided that other research takes advantage of the theory

and methodology developed for the present research, other measures should be useful in practical settings.

b. Manifestations of personality characteristics should also be found in the perceptions of other products since sterling silverware was selected as a representative of expensive home furnishings as a class. While there are reasons for expecting substantial manifestations for such products, it remains to be determined where the limits of the methodology lie.

2. Considering the variety of ways in which personality characteristics were found to manifest themselves in perceptions of sterling silver tableware, additional indices and measurements of product perception can also be expected to yield significant differentiations.

   a. All the indices employed in analyses of content, response-style, and structural differentiations among personality "types" yielded interpretable results, and there is little reason to think that interpretable results would not reoccur in other settings.

3. Considering the number and variety of relationships identified between personality and consumer-product perceptions, it is tempting to conclude that the present methodology provides a new and potentially fruitful means of improving our understanding of consumer behavior.

a. On the one hand, results supported the view that personality characteristics can be significant determinants of consumer perceptions.

b. On the other hand, results indicated that it is possible to take a detailed look at the complexities of consumer-product perceptions and to do so for several levels of cognitive functioning.

c. While the findings have their most direct implications for product perception and the role of personality in determining perception, the success of this research suggests that the role of almost unlimited numbers of social and contextual determinants might be investigated with a similar strategy.

d. Similarly, the methodology might be used to identify perceptual factors which guide the course of consumer decision processes and also to trace the consequences of consumer behavior over time.

4. Since the present results indirectly supported many aspects of the model underlying this research, the merit of applying the model to other consumer behavior problems is compelling.

a. For example, research has demonstrated that consumers and retailers have rather different perceptions of products (McClure and Ryans, 1968). Similarly, it is likely that consumers, manufacturers, designers, and advertising managers all have rather different perceptions.

If a marketing mix is to be truly effective, it is important that those responsible for the strategy have a thorough understanding of a product's perceived characteristics, of the organization of these characteristics, and of differences among the perceptions of those involved in establishing a marketing mix.

5. With respect to the objective of developing a highly versatile means of collecting perceptual-cognitive data, the Object Descriptions Task was a success, and the examples given below illustrate a few ways in which a single body of data might be viewed from several different perspectives. The examples also show that, depending upon the comprehesiveness of the research problem, it may be possible to develop procedures which minimize the work of each respondent while maximizing the scope of the information collected for solving practical problems.

   a. Researchers concerned with product development and marketing policy often need information about the perceived structure of a product line, how products in a line relate to competitive products by other manufacturers, what gaps there are in the line, whether consumer needs and preferences are being satisfied, and others. To seek answers to such questions, a researcher might administer the Object Descriptions Task to a group of people and calculate an object-by-object distance

matrix. The matrix could then be analyzed by hierarchical clustering or other multidimensional methods.

b. Some of the reasons why objects cluster as they do could be studied by obtaining the distributions (or configurations) of responses to individual products and/or product clusters. Since both applicability and like-dislike ratings are obtained with the Object Descriptions Task, such data might aid the development of advertising appeals and help designers understand the images conveyed by the motifs that they use. Under some circumstances, a respondent's task could be reduced by having respondents react to different subsets of objects, and data for the total sample could than be gathered without placing excessive burdens on consumers.

c. Consumer types might be identified from inter-person similarities in product perceptions, provided that a person by person matrix was calculated. This could be accomplished by having each respondent react to several objects in terms of a common set of attributes. If respondents had sufficient numbers of objects and attributes as a common basis of responses, a person by person matrix can be formed. This approach seems well-suited to investigating market segmentation on the basis of preference characteristics.

d. Object by object and/or attribute by attribute matrices could also be calculated for single individuals, given sufficient depth of information. While such a research design would entail gathering about the same amount of Object Descriptions Task data as was gathered for the present research, the research problem might not necessitate gathering such quantities of supplementary data.

6. Since numerous relationships between personality and consumer-product perceptions were successfully identified where similar research has been largely inconclusive, the responsibility for the success of this research lies partly with the data collection techniques employed.

   a. The Object Descriptions Task constituted a psychologically meaningful and, at the same time, efficient means of collecting perceptual-cognitive data. Respondents used response scales which were not as constraining as the bipolar dimensions of the Semantic Differential (Osgood, et al., 1957), the task was simpler to perform than a Q-sort (Stephenson, 1953), the technique was sensitive to individual differences, and large numbers of responses were expressed per unit of time.

   b. The Object Descriptions Task was simpler to construct than a Semantic Differential and than most unidimensional scales. Either denotative or connotative content could be selected from a relevant universe of content (i.e.,

discrete attributes). For example, if the purpose is to aid designers in determining what physical characteristics appeal to different people, considerable denotative content may be used. If the purpose is to develop motivational appeals appropriate to submarkets which may be reached selectively through various media, the instrument could include largely connotative content.

c. Even though the task pushed respondents near to the limits of their endurance, psychologically meaningful data were obtained throughout the task.

d. While the task was capable of yielding enough information for structural analyses of a single individual's perceptual-cognitive system, it may also be used to obtain responses to different objects from different people. Under these conditions, responses may be pooled for analysis and the demands made of each respondent can be reduced.

e. Valence responses given for each perceived characteristic of an object facilitated interpretation of responses and reduced demands on a researcher's ability to draw inferences. In addition, valence responses made it possible to use both denotative and connotative content in the instrument (the Semantic Differential is restricted to the use of polar opposites having rather unambiguous affective implications).

7. While the development of more flexible and sensitive means of collecting perceptual-cognitive data were essential for obtaining a better understanding of consumer perceptions, the methods developed for analyzing these data also contributed importantly to the success of the present research.

   a. The methods used to analyze complex perceptual characteristics and the methods used to differentiate between results obtained for separate personality "types" imposed rather few statistical constraints. Since social science data seldom satisfy linearity, normality, and other statistical constraints, there is a substantial need for methods capable of handling nonlinear and configural data without imposing unwarranted assumptions.

8. The data collection and data analysis methods developed for the present research constituted a highly integrated methodology for use in typological research dealing with consumer behavior and other social science problems.

   a. The Object Descriptions Task and most of the methods for analyzing the characteristics of types derived from the present model of perceptual-cognitive phenomena.

   b. In large part, the analysis methods complemented one another since they dealt with different aspects of the model.

   c. While the generality of the present results may be limited to products having style as a major characteristic,

the methods themselves were sufficiently flexible and general that they may be applied in many situations concerned with complex perceptual-cognitive phenomena. For example, the content differentiation analyses of Object Descriptions data might be used to provide designers and/or advertisers with information concerning product features which are salient to different market segments and make it possible to differentiate them. In other words, such information might be an aid to product development and the development of advertising appeals tailored to consumer needs.

9. Whereas typological research strategies typically yield insignificant typal differentiations, results obtained using the present methodology showed that personality "types" are sufficiently stable that reliable differentiations may even be obtained with rather small groups.

   a. While the validity of this conclusion was markedly dependent upon the use of highly sensitive data collection and data analysis methods it serves to emphasize that statistical significance may actually depend more upon research methodology than upon sample size. In the present research, the question of statistical significance arose solely in connection with the stability of typal characteristics. The number of persons in a "type" was not a relevant consideration.

b. The magnitude and form of typal differentiations obtained here indirectly supported the idea that complex characteristics may easily be obscured by single sample approaches which utilize methods such as correlation and cross-classification. For example, content and response-style results for Cognitive Complexity and Dogmatism subgroups evidenced nearly perfect inverse trends (i.e., High Complexity was similar to Low Dogmatism and vice versa). Under these conditions, one would expect a high negative correlation between Complexity and Dogmatism; yet, a crossbreak of the extreme scorers on the two inventories found that the correlation was near zero.

c. Although the Object Descriptions Task is certainly expensive to administer, the ability to use a typological approach with relatively few representatives of each type may compensate for the increased cost of obtaining data. When each type was analyzed separately, within-group variance was sufficiently low that stable typal characteristics could emerge.

d. The stability of the present results also provides some impetus for exploring effective means of identifying market segments for which personality differentiations are, in fact, reflected in perceptions of everyday objects.

10. While the generality of the present findings may seem limited (only girls with primarily middle-class background participated in the study), the question of sample representativeness poses fewer problems for typological research than for research seeking global relationships among variables.

    a. Since the study was concerned with people's perceptions of expensive home furnishing products that have style as a major source of differentiation, the Ss who participated in the study were very likely representative of the population sector constituting the potential market for such products. The Ss may also represent a population sector for which relationships between personality and consumer-product perceptions are quite likely. Middle-class people can often afford the luxury of developing esthetic preferences, and females generally assume this role as it applies to home furnishing products.

    b. The typological approach used in the present research avoids many sample representativeness problems. When generalizing results from typological research, one should only generalize to population "types" that correspond to sample "types." It is unnecessary for the sample to be representative of the entire population; it is only necessary for the sample "types" to correspond to population "types." One can draw conclusions about typal differences without regard to whether all types have been examined.

c. To the extent that sample homogeneity tended to reduce variance in observations, it was all the more difficult to identify well-defined types. Consequently, the fact that analyses yielded substantial perceptual differences strengthens support for the hypotheses tested as well as for the underlying model and research methods.

Implications for Further Research

1. Since the model of complex perceptual-cognitive processes presented in Chapter II is static, further development of the model should be concerned with examining the processes by which cognitive elements enter or emerge within a system and the processes by which systems change over time.

   a. Although research concerned with attitude organization and change is extensive (see Insko, 1967), most of it deals with change in overall attitude toward an object as a result of internal influences or efforts to create an imbalance in affective relationships among cognitive elements. Although research concerned with cognitive structure and value systems is also extensive (e.g., Kerlinger, 1967; Peabody, 1967; Osgood, 1962; Rokeach, 1968), much of this research is concerned with the semantic organization of cognitive or value systems. The present model constitutes an effort to bridge the gap between attitude research and research on cognitive systems. In the model, cognitive elements are defined in terms of both content and affect, and analysis methods

are used to reveal relationships between cognitive elements as well as to reveal the structure of these relationships. Extending the model so that it is process oriented would add a dimension that could take the model well beyond the models from which it derives.

2. In the present research, all attributes used in the Object Descriptions Task were either positive in form or capable of being interpreted positively or negatively depending upon the perceiver's perspective. In future research, the relative merits of using attributes yielding different degrees of variation in perception could be explored.

3. If further use is to be made of this research strategy, it would be desirable to simplify ways of defining a relevant universe of content.

   a. The problem of defining content universes is formidable and the problem of deciding what restrictions should be placed on the selection of content is even more difficult.

   b. The problem of the sorts of content to use is especially important since it affects what respondents will think of as "contrasting ideas."

4. Since the Object Descriptions Task allows for many sorts of individual differences, a general problem worth exploring concerns the affective significance of attributes as a function of respondent, object, and context.

a. While the Object Description Task derives much of its usefulness from the fact that members of different types use attributes quite differently, traditional attitude scaling instruments and the Semantic Differential are constructed with the requirement that most respondents have similar perceptions of the content or items used. The present findings suggest that such restrictions may very well eliminate content which makes differentiation possible. Supporting arguments on this point have also been developed by Fishbein (1967b).

5. In further research it would be desirable to simplify the data collection process by constructing mechanical, electro-mechanical, or electronic equipment for presenting attributes and for recording responses.

   a. Since the Object Descriptions Task uses the same response scales for each item of content, the use of automated data collection techniques is highly compatible with characteristics of the instrument.

   b. Automated data collection could reduce the quantity of materials and apparatus which respondents must handle during the Object Description Task. As a result, the introduction of more technology could easily make the task more natural to respondents.

c. As the computer dependent aspects of such research become more sophisticated, virtually all the steps from data collection through final data analyses could be performed without human intervention. Where human decisions are required, interactive computer systems could be developed.

6. Since the Object Descriptions Task has implications for attitude scaling, further research should explore the utility of estimating attitude from Object Descriptions Task data.

   a. The combination of applicability and like-dislike ratings of individual attributes focuses attention on the cognitive details from which attitudes may derive. By obtaining affective reactions to detailed associations rather than to an object as a whole (e.g., statements of attitude), researchers may also be able to obtain more reliable estimates of attitude. Assuming that objects are defined by their characteristics, the approach would appear worthy of investigation.

   b. While the Semantic Differential has enjoyed considerable use in advertising research, only the evaluative dimension is used to estimate attitude. With the Object Descriptions Task, however, each characteristic has an evaluative component. As a result, an attitude estimate may be based on the cognitive detail of one's attitude, and both the magnitude and the organization of attitudes may be examined.

c. While a great deal of research indicates that intensity ratings add rather little to instrument reliability, the present research shows that there are circumstances in which intensity and valence information causes an instrument to be quite sensitive to individual differences. The implications of these findings should be examined further.

7. Further development of methods for analyzing complex systems and for differentiating between them is also in order.

   a. While the method of identifying salient content yielded satisfactory results, the merits of alternative procedures should be explored.

   b. Since the content differentiation analyses relied upon a researcher's ability to find organization in salient content, supporting statistical procedures should be developed. For example, one might determine the probability that salient content for a "type" includes a specified proportion of the content within some class of content.

   c. Response-style differentiation analyses might undergo refinement if one were to experiment with the basic affective weights of the content employed.

   d. Since several of the methods for analyzing structure and making structural differentiations between "types" were

developed almost by accident, the merits of other methods should be examined.

8. The results of the structure similarity analyses rather naturally lead to the speculation that these same methods may be used to study structural changes across situations and across time. In particular, the analyses of cognitive subsystems suggest that molar comparisons of different systems can be summarized with relatively simple indices.

   a. Changes over time might be studied as follows. Suppose, for example, that a market researcher wanted to study changes in people's perceptions of a product line. Object Descriptions data on the products under consideration might be obtained at different times, and object by object matrices could be formed from these data. Hierarchical clustering results from analyses of these matrices could then be analyzed with the method for estimating the similarity of hierarchical systems. One could determine which objects in the system were moving and how these objects were moving. Changes in system organization could also be related to changes in marketing policy, competitive situation, broader social changes, style trends, etc.

9. On the whole, the research findings suggest that intensive, small-sample studies of types can be more valuable to theorists and applied researchers than more superficial studies based on large heterogeneous samples.

a. The data collection techniques and analysis methods developed for the present research were capable of identifying many sorts of differences between personality types. The apparent merits of the strategy and methods employed here stand in direct contrast to the meager success of cognitive mapping efforts employing more traditional methods.

b. While the generality of the present research strategy may be restricted to the class of expensive home furnishing products, the comprehensiveness of the findings suggests that the strategy and methods may also succeed for many other sorts of objects.

10. Efforts should be made to replicate the present findings using other approaches.

a. In the present research, evidence of validity derived mainly from the consistency of results obtained for different personality measures and for different aspects of consumer-product perceptions. While the evidence for validity was strong, it is important to supplement this evidence through replication with a different sample.

b. Since the data for the present research were gathered over a relatively short period of time, efforts should be made to check on the independence of observations. For example, the strength of the results would be substantially increased if there was little reason to

suspect that Ss might form a connection between the personality data and the object perception data. In the present research, there is only indirect evidence pertaining to this question. In particular, it seems unlikely that Ss could have anticipated the complexity of either the response-style or structural results. Nevertheless, it is interesting to note that these results were at least as clearcut as the content differentiation results.

11. To provide further tests of the model, the present findings should be cross-validated with other personality variables and other objects.

    a. Although personality measures concerned with content as well as ones concerned with structure were selected, many other measures might have been selected.

    b. Since sterling silver tableware appeared to be a product with strong symbolic potential, it is important to determine whether similar results may be obtained for classes of objects with less obvious symbolic significance.

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APPENDICES

APPENDIX A

PRELIMINARY INSTRUCTIONS

Participation Requirements

Introduction

General Instructions

Esthetic Preferences Study

(Participation Requirements)

Before you begin this study we want to be sure that you are clear about the general requirements for participation.

1. You will be able to participate in the study on this day of the week and at this time for three weeks.

2. You have this class period and the next one free.

If either of these conditions are not met, please talk to the person assisting with the study. It may be necessary to have you sign up for a different day and time.

Esthetic Preferences Study

(Introduction)

Commercial designers and manufacturers, who are interested in marketing products more suitable to people's tastes, need better methods for finding out how people react to their products, especially newly developed products.

One purpose of this study is to test some new methods for obtaining information about people's tastes and preferences. Another purpose is to use these methods to find out more about the nature of individual differences in tastes and preferences. And a third purpose is to investigate some of the reasons why people react to certain objects as they do.

Several parts of this study are concerned with a type of home furnishing product that may be of interest to many of you. At one time or another during this session or during the next two sessions, you will be asked to express your reactions to a number of different examples of this product.

Esthetic Preferences Study

(General Instructions)

The materials in front of you are the ones to be used for this session. Proceed through them in the order that they are arranged.

After you have read the instructions for a part of the study, please proceed with it regardless of whether other students in your group are being asked to answer the same part at that time. Some of you will be asked to work on different things at different times.

As you finish with materials, please place them in the envelope with your name on it.

Also, it would be greatly appreciated if you <u>did not discuss</u> the procedures or contents of these sessions for awhile. After the third week is over you are welcome to discuss whatever you wish. In the meantime, however, please try to refrain from talking about the questionnaires or your responses to the different objects.

APPENDIX B

PERSONALITY INVENTORIES

Cognitive Complexity Index

Dogmatism Scale

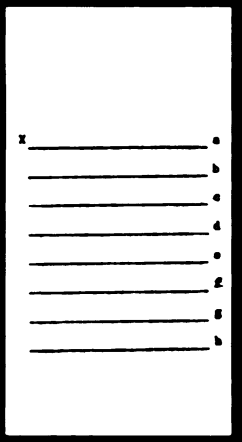
Orientation Inventory

Value Survey

INSTRUCTIONS

On the attached card, please write the names of eight persons who closely match the descriptions listed below (a. to h.). These should be people that you know personally. Do not repeat any names. When you are finished with this part of the study you may keep the card, so write the name or any other identifying information that you care to.

a. Closest friend of the same sex as yourself
b. Person of the opposite sex you find hard to like
c. A friend you admire of the same sex as yourself
d. Closest friend of opposite sex (or spouse)
e. Person of same sex with whom you feel most uncomfortable
f. A friend you admire of the opposite sex
g. Person of the same sex you find hard to like
h. Person of the opposite sex with whom you feel most uncomfortable



Now that you have written the names of eight persons on the card, we would like to have you rate each of these people on a number of characteristics.

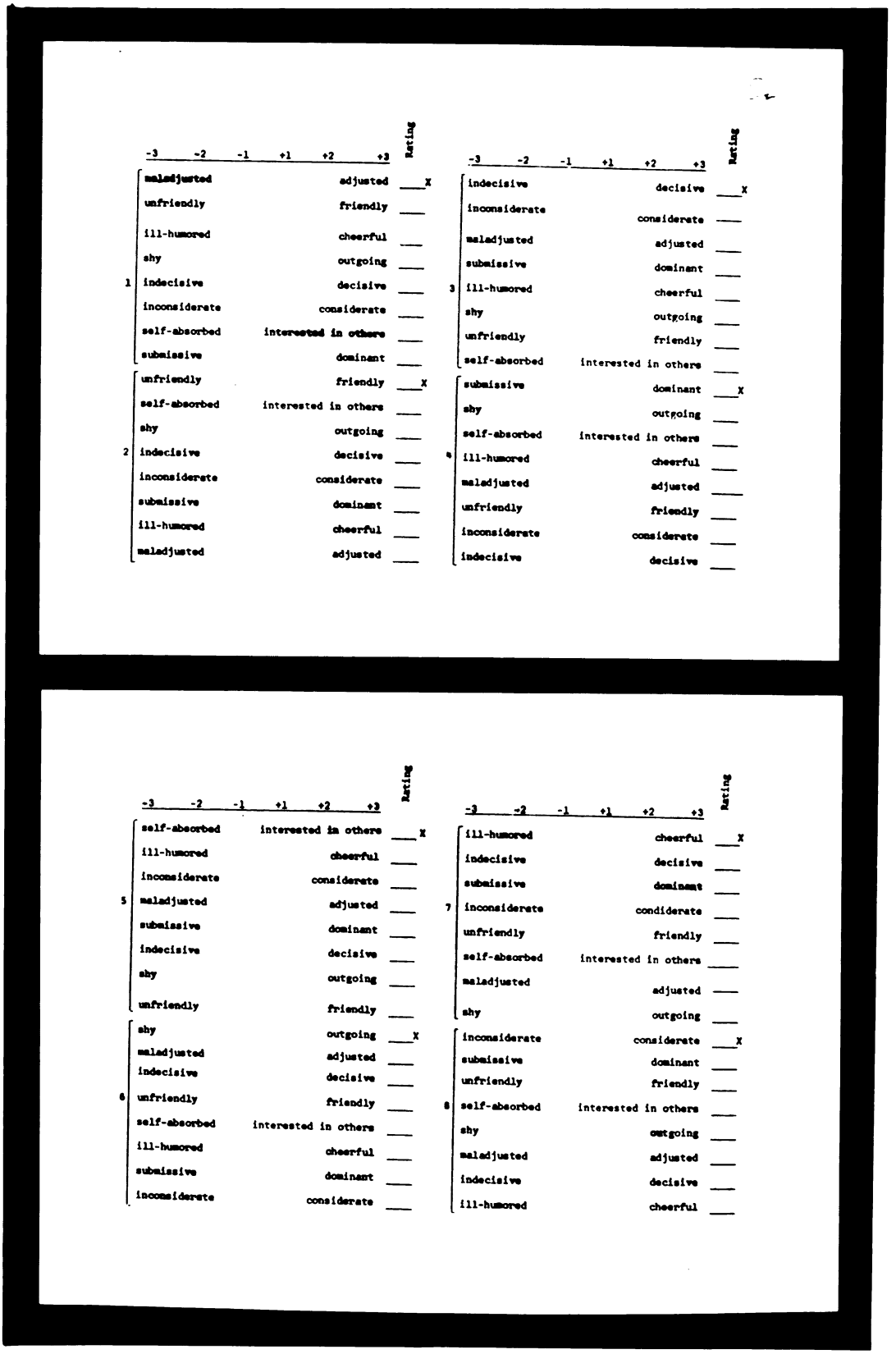
On the following pages there are eight sets of characteristics to be rated. Each set includes eight pairs of characteristics, one pair for each of the persons listed on your card

Begin by placing the card next to the first set of characteristics so that the "X"s are lined up. Then, decide how you would rate person "a" on the first scale, which is MALADJUSTED - ADJUSTED. Your answers will indicate the degree to which one or the other characteristic in the scale seems to describe the person. You may use ratings of -3, -2, -1, +1, +2, or +3. If this person seems very adjusted use +3. If the person seems very maladjusted use -3. Write your answer in the space at the right of the scale. After you have rated person "a", decide how you would rate person "b" on the second scale, which is UNFRIENDLY - FRIENDLY.

After you have rated all eight persons on one set of characteristics, move the card to next set and rate the eight persons on this set of characteristics.

Please continue making these ratings until you have given answers for all eight sets of characteristics.

Cognitive Complexity Index



-3	-2	-1	+1	+2	+3	Rating
maladjusted					adjusted	X
unfriendly					friendly	
ill-humored					cheerful	
shy					outgoing	
1 indecisive					decisive	
inconsiderate					considerate	
self-absorbed					interested in others	
submissive					dominant	

-3	-2	-1	+1	+2	+3	Rating
indecisive					decisive	X
inconsiderate					considerate	
maladjusted					adjusted	
submissive					dominant	
3 ill-humored					cheerful	
shy					outgoing	
unfriendly					friendly	
self-absorbed					interested in others	

-3	-2	-1	+1	+2	+3	Rating
unfriendly					friendly	X
self-absorbed					interested in others	
shy					outgoing	
2 indecisive					decisive	
inconsiderate					considerate	
submissive					dominant	
ill-humored					cheerful	
maladjusted					adjusted	

-3	-2	-1	+1	+2	+3	Rating
submissive					dominant	X
shy					outgoing	
self-absorbed					interested in others	
4 ill-humored					cheerful	
maladjusted					adjusted	
unfriendly					friendly	
inconsiderate					considerate	
indecisive					decisive	

-3	-2	-1	+1	+2	+3	Rating
self-absorbed					interested in others	X
ill-humored					cheerful	
inconsiderate					considerate	
5 maladjusted					adjusted	
submissive					dominant	
indecisive					decisive	
shy					outgoing	
unfriendly					friendly	

-3	-2	-1	+1	+2	+3	Rating
shy					outgoing	X
maladjusted					adjusted	
indecisive					decisive	
6 unfriendly					friendly	
self-absorbed					interested in others	
ill-humored					cheerful	
submissive					dominant	
inconsiderate					considerate	

-3	-2	-1	+1	+2	+3	Rating
ill-humored					cheerful	X
indecisive					decisive	
submissive					dominant	
7 inconsiderate					condiderate	
unfriendly					friendly	
self-absorbed					interested in others	
maladjusted					adjusted	
shy					outgoing	

-3	-2	-1	+1	+2	+3	Rating
inconsiderate					considerate	X
submissive					dominant	
unfriendly					friendly	
8 self-absorbed					interested in others	
shy					outgoing	
maladjusted					adjusted	
indecisive					decisive	
ill-humored					cheerful	

Cognitive Complexity Index (cont.)

STATEMENTS OF OPINION

The following are some statements people have made as their opinion on several topics. In selecting the ones that appear here, we tried to cover many different and opposing points of view. You may find yourself agreeing strongly with some of the statements, disagreeing just as strongly with others, and perhaps uncertain about others. Whether you agree or disagree with any statements, you can be sure that many other people feel the same as you do.

We want your personal opinion on each statement. Mark each statement in the left margin according to how much you agree or disagree with it. Please mark every one. Write A1, A2, A3, or D1, D2, D3, depending on how you feel in each case.

Agree		Disagree	
A1:	I agree a little	D1:	I disagree a little
A2:	I agree on the whole	D2:	I disagree on the whole
A3:	I agree very much	D3:	I disagree very much

____ 1. In this complicated world of ours the only way we can know what's going on is to rely on leaders or experts who can be trusted.

____ 2. My blood boils whenever a person stubbornly refuses to admit he's wrong.

____ 3. There are two kinds of people in this world: those who are for the truth and those who are against the truth.

____ 4. Most people just don't know what's good for them.

____ 5. Of all the different philosophies which exist in this world there is probably only one which is correct.

____ 6. The highest form of government is a democracy and the highest form of democracy is a government run by those who are most intelligent.

____ 7. The main thing in life is for a person to want to do something important.

____ 8. I'd like it if I could find someone who would tell me how to solve my personal problems.

____ 9. Most of the ideas which get printed nowadays aren't worth the paper they are printed on.

____ 10. Man on his own is a helpless and miserable creature.

____ 11. It is only when a person devotes himself to an ideal or cause that life becomes meaningful.

____ 12. Most people just don't give a "damn" for others.

____ 13. To compromise with our political opponents is dangerous because it usually leads to the betrayal of our own side.

____ 14. It is often desirable to reserve judgment about what's going on until one has had a chance to hear the opinions of those one respects.

____ 15. The present is all too full of unhappiness. It is only the future that counts.

____ 16. The United States and Russia have just about nothing in common.

____ 17. In a discussion I often find it necessary to repeat myself several times to make sure I am being understood.

____ 18. While I don't like to admit this even to myself, my secret ambition is to become a great person, like Einstein, or Beethoven, or Shakespeare.

____ 19. Even though freedom of speech for all groups is a worthwhile goal, it is unfortunately necessary to restrict the freedom of certain political groups.

____ 20. It is better to be a dead hero than to be a live coward.

Dogmatism Scale

Orientation Inventory

Bass, B. M., The Orientation Inventory. Palo Alto, California: Consulting Psychologists Press, 1962.

Value Survey

Rokeach, M. M., Value Survey. Lansing, Michigan: Jenca Associates, 1967.

APPENDIX C

OBJECTS USED IN THE STUDY

List of Forks Used in the Object Evaluations Task

List of Forks Used in the Object Descriptions Task

Pictures of All Sixty Forks

TABLE C-1

List of Forks Used in the Object Evaluations Task

Identification Number	Name of Pattern	Manufacturer
1	Strasbourg	Gorham
2	Stardust	Gorham
3	Governor's Lady	Gorham
4	New Chelsea	Gorham
5	Luxembourg	Gorham
6	Albemarle	Gorham
7	Gossamer	Gorham
8	Camelia	Gorham
9	Alencon	Gorham
10	Pirouette	Alvin
11	Gorham Plain	Gorham
12	Lily of the Valley	Gorham
13	Louis XV	Gorham
14	Lady Baltimore	Whiting
15	Chantilly	Gorham
16	Regent	Durgin
17	La Scala	Gorham
18	Roanoke	Gorham
19	Victorian	Durgin
20	Celeste	Gorham
21	Theme	Gorham
22	Vivaldi	Alvin
23	Old Mothers	Gorham
24	Buttercup	Gorham
25	Melrose	Gorham
26	King George	Gorham
27	Nocturne	Gorham
28	King Albert	Gorham
29	Chapel Bells	Alvin
30	Southern Charm	Alvin
31	Prince Eugene	Alvin
32	English Gadroon	Gorham
33	French Scroll	Alvin
34	Chateau Rose	Alvin
35	Bridal Bouquet	Alvin
36	Madame Morris	Whiting
37	Saint Dunstan (Plain)	Gorham
38	Rondo	Gorham
39	English Rose	Durgin
40	Baronial	Gorham

TABLE C-1

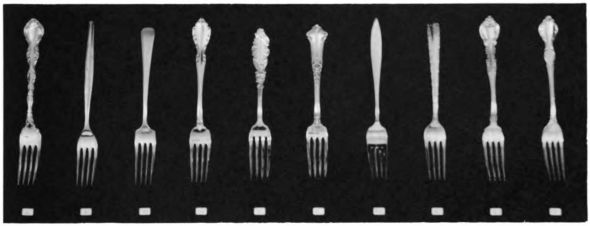
Continued

Identification Number	Name of Pattern	Manufacturer
41	Rose Tiara	Gorham
42	Versailles	Gorham
43	Fairfax	Gorham
44	Edgeworth	Gorham
45	Adam	Whiting
46	Decor	Gorham
47	Lyric	Gorham
48	Spring Bud	Alvin
49	Firelight	Gorham
50	Old English Tipt	Gorham
51	Etruscan	Gorham
25	Sovereign	Gorham
53	Blithe Spirit	Gorham
54	Classique	Gorham
55	Rosecrest	Alvin
56	Willow	Gorham
57	Old French	Gorham
58	King Edward	Gorham
59	Imperial Queen	Whiting
60	Greenbriar	Gorham

TABLE C-2

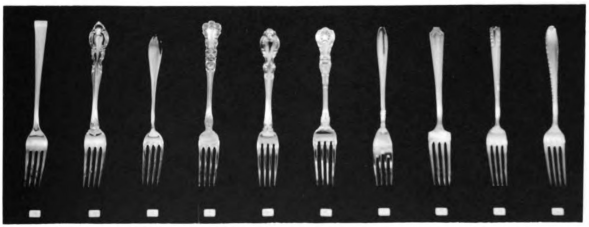
List of Forks Used in the Object Descriptions Task

Identification Number	Name of Pattern	Manufacturer
7	Gossamer	Gorham
18	Roanoke	Gorham
20	Celeste	Gorham
24	Buttercup	Gorham
27	Nocturne	Gorham
33	French Scroll	Alvin
35	Bridal Bouquet	Alvin
38	Rondo	Gorham
41	Rose Tiara	Gorham
45	Adam	Whiting
48	Spring Bud	Alvin
50	Old English Tipt	Gorham
51	Etruscan	Gorham
53	Blithe Spirit	Gorham
54	Classique	Gorham
55	Rosecrest	Alvin
58	King Edward	Gorham
60	Greenbriar	Gorham



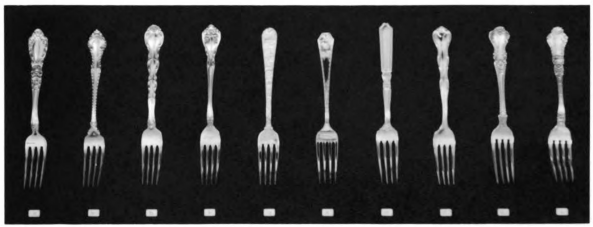
01 10

11 20

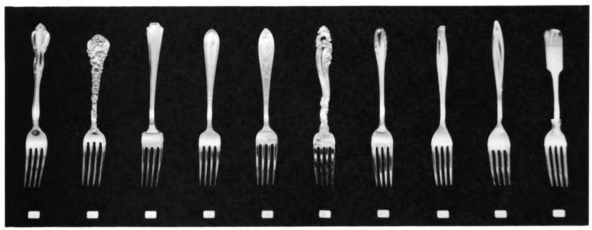


21 30

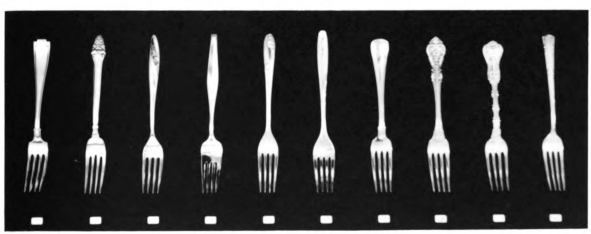
Pictures of All Sixty Forks



31 40



41 50



51 60

Pictures of All Sixty Forks (Cont.)

APPENDIX D

OBJECT EVALUATIONS TASK

Instructions and Response Forms

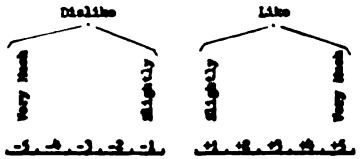
Diagram of the Display

Object Evaluations

In this part of the study you will be asked to indicate the degree to which you dislike or like a number of sterling silver forks. The various forks to be rated have been set out in a random order on some tables.

For each fork you are to consider the following question.

To what degree do you dislike or like this fork?



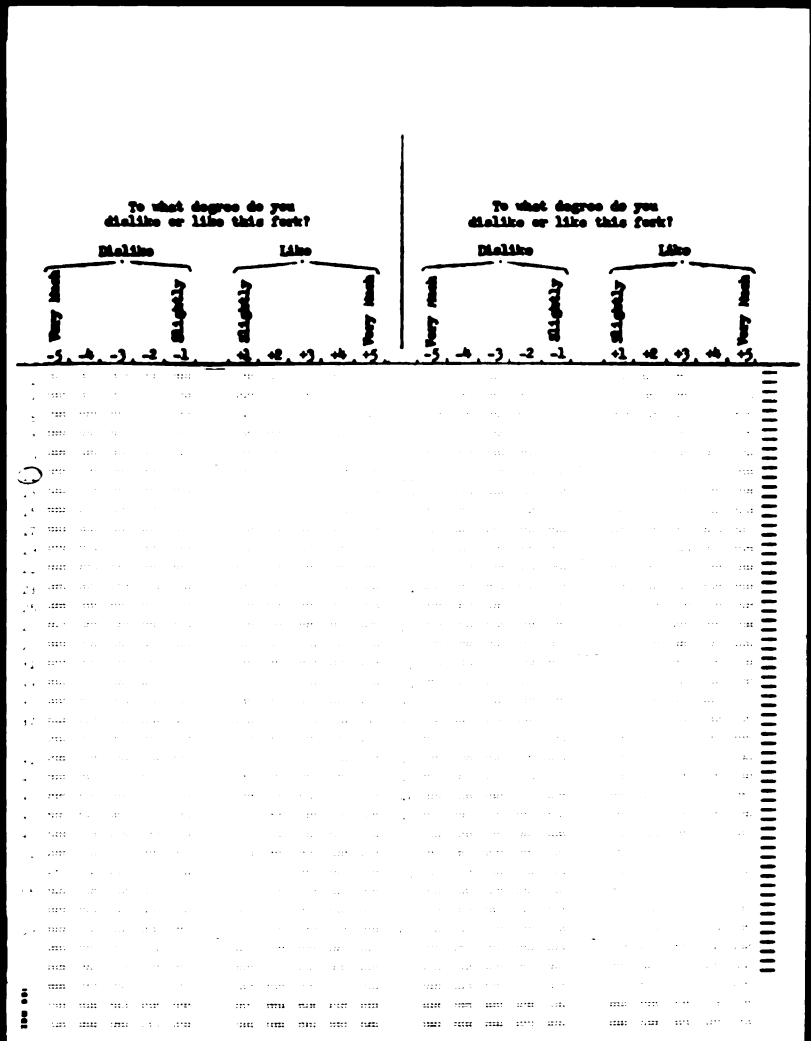
Decide which scale position comes closest to indicating how you feel about the design and mark your answer on the multiple-choice answer sheet provided.

Clipped to the top of the answer sheet is a piece of paper with the question to be answered. The various response categories are lined up with the columns to be used. The numbers on the answer sheet correspond to the numbers beneath the forks.

Please begin your ratings with the number which has been circled on your answer sheet. Proceed through the numbers in order. When you reach the last fork, return to the first fork and make ratings from fork number 1 to your starting number. Be sure to make a rating for each fork.

Please do not spend a great deal of time deciding the extent to which you dislike or like any particular design. We are mainly interested in your overall impression of each fork.

We would appreciate it if you did not pick the forks up. If they get moved, there is no way of knowing which ratings and which forks correspond.



Instructions and Response Form

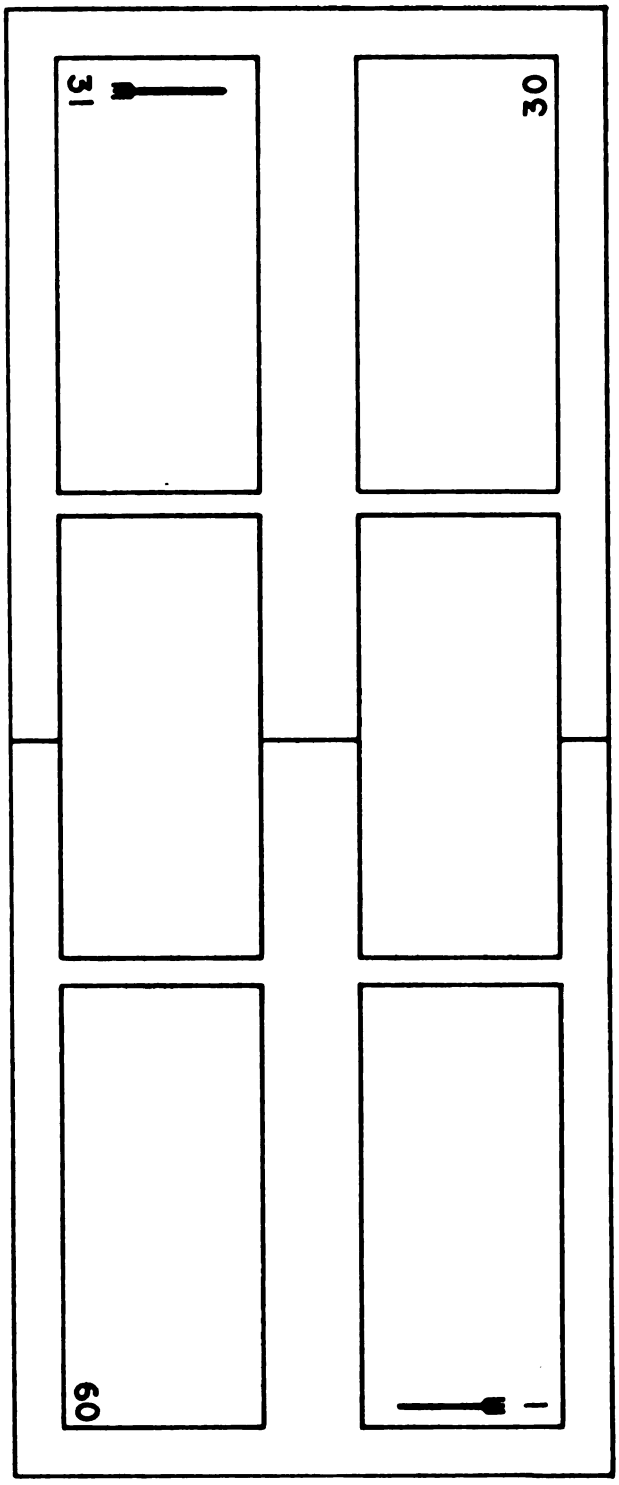


Diagram of Display for the Object Evaluations Task

APPENDIX E

OBJECT DESCRIPTIONS TASK

Diagram of Room Arrangement

Picture of Table Layout

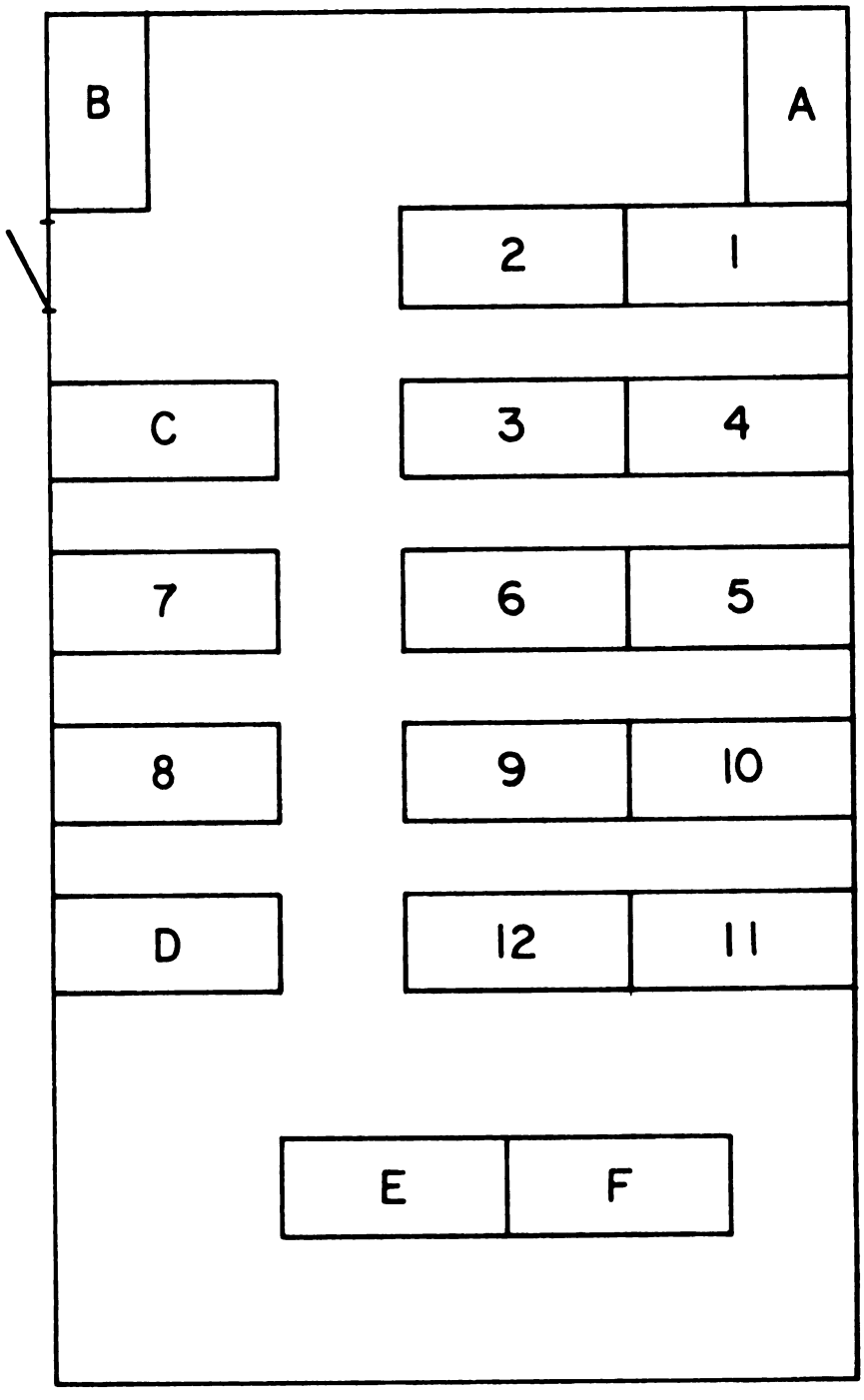
Instructions

Attribute Response Apparatus

List of Attributes Presented

Random Orderings of the Forks

Identifying a Universe of Content
and Selecting Attributes



1 to 12 = Seating positions for Object Descriptions Task
A = Table for collecting the forks
B and C = Tables for materials to be handed out
D = Table with forks arranged in their presentation sequence
E and F = Tables for display used in Object Evaluations Task

Diagram of Room Arrangement

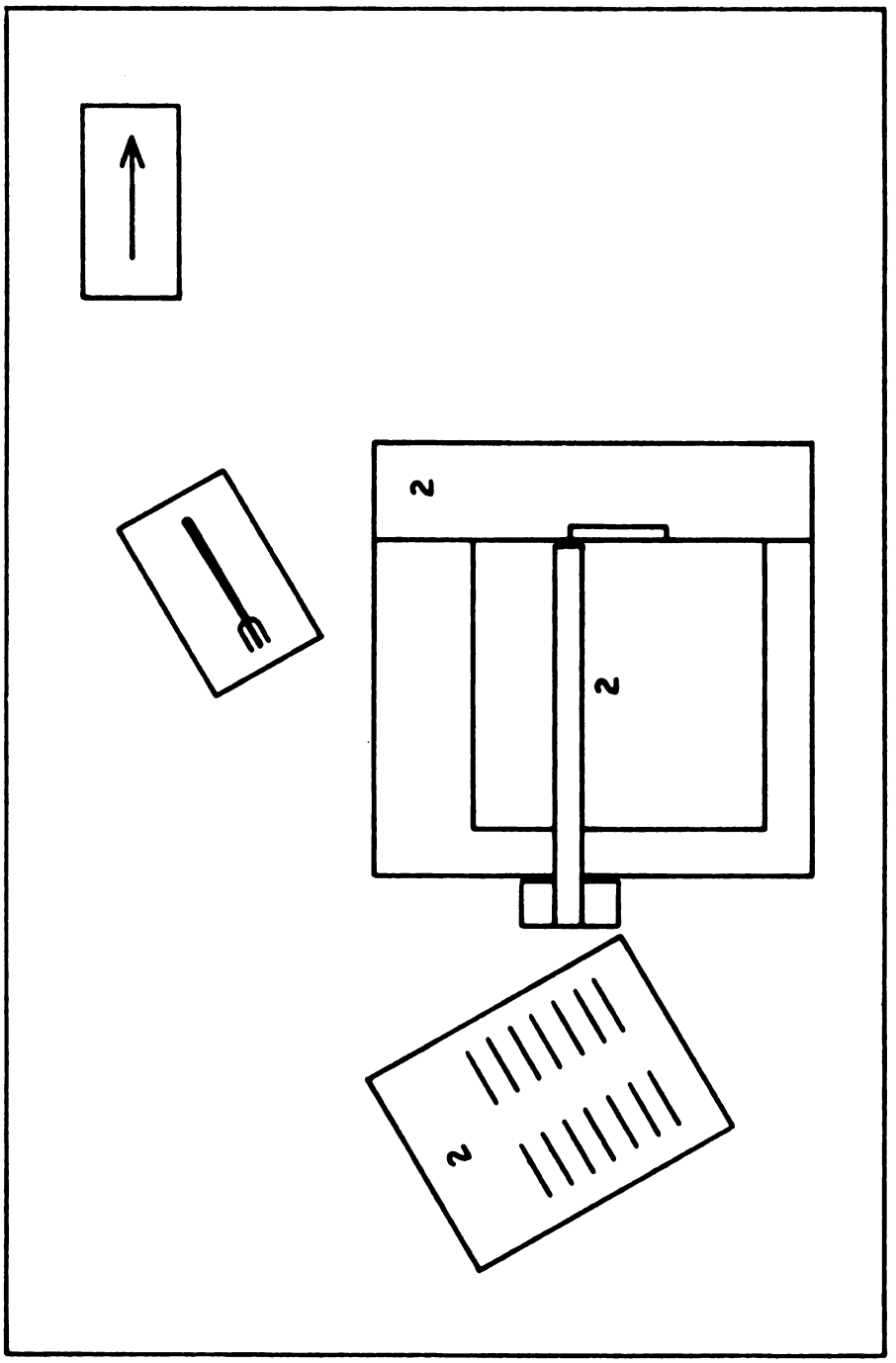


Table Layout

Associated Characteristics

In this part of the study you will be asked to indicate some things about characteristics that you associate with several different pieces of sterling silver tableware.

You will be shown silver forks representing a variety of designs. For each fork, you will be asked to make a number of judgments based on words listed in the attached booklet.

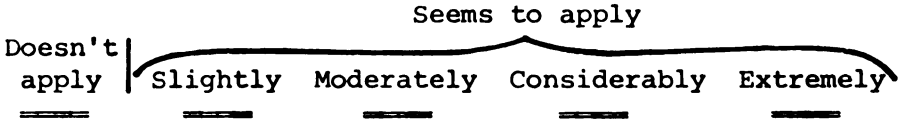
There is one list of words to be used with each fork. For each word in a list, you are to consider whether you think the word listed or an idea that seems to contrast with it describes a particular fork.

The questions to be answered are on the next page.

Here is what you are to do for each word appearing in a list, after you have briefly examined the fork you will have in front of you.

First, consider whether the word listed seems to apply to this fork and answer the following two questions.

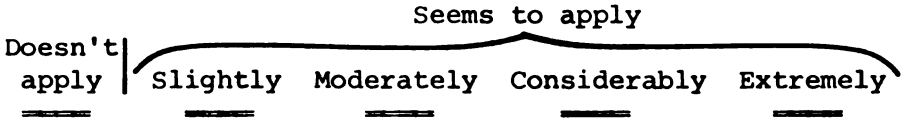
1. To what degree do you think this word listed seems to apply to this fork?



2. If the word seems to apply, to what degree do you dislike or like this characteristic of this fork?

Second, try to think of a word or idea which seems to contrast with the one listed and answer the following two questions.

1. To what degree do you think that a contrasting word or idea seems to apply to this fork?



2. If a contrasting word or idea seems to apply, to what degree do you dislike or like this characteristic of this fork?

You needn't have a specific word in mind for a contrasting idea so long as you at least have some feeling about what you would contrast with the word listed.

In considering what characteristics you associate with a particular fork, you are free to answer that a word listed applies, that a contrasting idea applies, that both apply, or that neither applies. You are also free to respond to as many or to as few words and contrasting ideas as seem to apply.

For each fork, be sure to go through the list of words in order, but please do not puzzle over your answers. It is your first impressions that we want. However, try not to be careless because we do want to know what your impressions are.

You are to mark your answers on the multiple-choice answer sheets inserted in the apparatus before you. There is one answer sheet for each fork, and each word on a list corresponds to one row on an answer sheet.

The number of a word appears at the left of the apparatus. The four questions appear at the top, and the response categories are lined up with the columns.

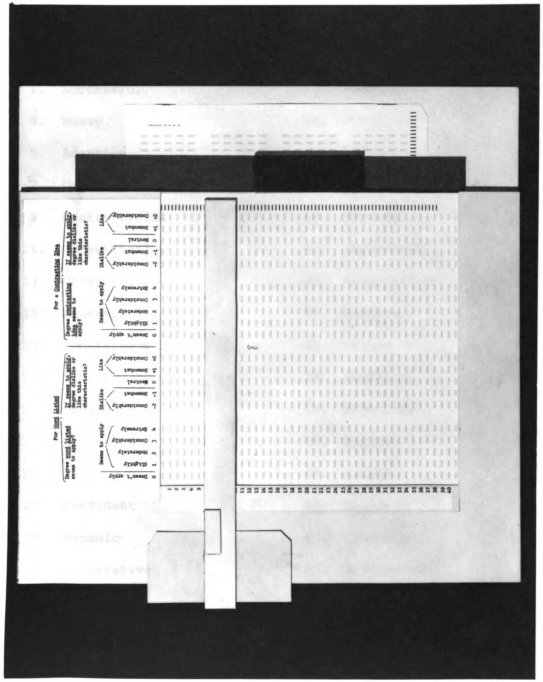
There is a number in the center of each answer sheet. Before you start marking answers for a fork, be sure that the list of words and the answer sheet you are using have the same number.

To make this study feasible, it is necessary to obtain answers from several individuals at the same time. After all of you have finished with one fork, you are to pass this fork on to the next person. However, to do this without confusion, you will all have to work at about the same rate so that all the forks can be passed at the same time.

You should try to finish a list in about 5 minutes. At first, it may take longer, but, as you become familiar with the questions, you should be able to work faster.

Also, after you become familiar with the questions, you may omit marking anything for words listed that do not seem to apply and for contrasting ideas that do not seem to apply.

Please be careful to mark your answers on the correct row and on the correct half of a row.



Attribute Response Apparatus

TABLE E-1

List of Attributes Presented

No.	Attribute	No.	Attribute
1.	Successful	37.	Futuristic
3.	Heavy	39.	Proud
5.	Adaptive	41.	Refined
7.	Urban	43.	Historical
9.	Controversial	45.	Skilled
11.	Geometrical	47.	Impersonal
13.	Unsystematic	49.	Asymmetrical
15.	Reserved	51.	Youthful
17.	Spontaneous	53.	Secure
19.	Trusting	55.	Profound
21.	Sociable	57.	Masculine
23.	Upper Class	59.	Serious
25.	Aloof	61.	Simple
27.	Confident	63.	Balanced
29.	Dynamic	65.	Cautious
31.	Cooperative	67.	Impressive
33.	Innovative	69.	Individualistic
35.	Leisurely	71.	Restrained

TABLE E-2

Random Orderings of the Forks

Position in Presentation Sequence	Identification Numbers for Forks in		
	Order 1	Order 2	Order 3
1	53	20	60
2	55	51	24
3	38	45	50
4	33	53	20
5	7	38	55
6	20	41	51
7	48	18	33
8	24	58	54
9	51	55	18
10	50	33	35
11	41	35	53
12	54	48	58
13	35	60	45
14	27	7	27
15	58	54	41
16	45	24	7
17	18	50	48
18	60	27	38

Identifying a Universe of Content and Selecting Attributes

While the Object Descriptions Task facilitated the use of both denotative and connotative content, there were some problems in arriving at the actual attributes to use for the present research. First, there was the general problem of identifying a "universe" of content appropriate to describing sterling silver tableware (i.e., content which might generally be regarded as a potential descriptor of some silverware designs. Second, there was the problem of selecting a representative sample from the relevant universe of content.

In the course of developing the Object Descriptions Task several preliminary studies were conducted. Two of these studies were concerned with identifying words and phrases which might be used in describing reactions to one or another sterling silverware pattern. The studies mainly served the purpose of defining the sorts of content which might be endorsed. The words and phrases used in these studies were drawn from several sources: a variety of research using Semantic Differentials, a thesaurus search, books on the design of silverware and other home furnishings, designers and marketing research personnel. Ss were asked to indicate whether it seemed possible that they might use given words and phrases for describing aspects of their reactions to some silverware patterns. To aid Ss in their task, pictures of a wide variety of designs were projected on a screen throughout each session.

In the first study, 62 undergraduates (mainly freshmen) responded to a list of 485 words and phrases at two sessions which

were approximately one week apart. Eight random orderings of the list were used and both times these were assigned to Ss at random. The data were analyzed for response consistency (endorsed both times or not endorsed both times versus a mixed response). A statistically significant degree of consistency was obtained for 415 of the 485 words and phrases (.05 level, one-tailed binomial test).

In the second study, which was conducted as part of a manufacturer's national study of consumer silverware preferences, three samples of 70 to 75 married women representing a broad age range responded to lists of 172 words and phrases on one occasion. There were 5 random orderings of each list, and approximately 125 of the 172 in each list were drawn from the lists for the first study and several others were repeated. The data were analyzed for a significant tendency toward either endorsement or rejection and significance was obtained for approximately 435 of the 501 words and phrases represented in the three lists (.05 level, 2-tailed binomial test).

The results of the two studies were in high agreement. Of the 381 words and phrases in both studies, about 330 evidenced a significant tendency to be either endorsed or rejected in both studies. In other words, the studies demonstrated that Ss gave reliable responses and that rather diverse groups of Ss were in good agreement with one another.

Although these studies provided the writer with a rather good feeling for whether given content would be endorsed, it seemed necessary to have additional information for selecting attributes which were reasonably representative of the relevant universe of

content. In order to identify important perceptual content areas, several theories and research findings pertaining to the perception of physical and social objects were carefully examined with the objective of developing a classification scheme that simultaneously encompassed the content areas for all of them. The particular theories and researches included in these comparisons were:

1. The theory underlying the subscales of Bass's Orientation Inventory (1962, 1967) and correlates of these subscales.
2. Research by Kerlinger (1967) into the factor structure underlying perception of desirable teacher characteristics.
3. Theory and research by Osgood, et al. (1957, 1961, 1962) pertaining to the dimensionality of meaning.
4. Content factors yielded by Peabody's (1967) research into trait inferences.
5. Theory and research pertaining to content characteristics of belief systems (Rokeach, 1960), different levels of beliefs (Rokeach, 1968), and organization of value systems (Rokeach, 1968).
6. Talbott's (1968) research into the dimensionality of source evaluation.

A classification scheme abstracted from comparisons of these researches is presented on the following pages. While the categories of this classification scheme are not exhaustive and may not even be mutually exclusive, the scheme is offered as a first effort to

identify recurring content groupings applicable to a wide range of objects. For the most part, attributes selected for the Object Descriptions Task were selected so as to be representative of these classification categories.

TABLE E-3

A Classification of Recurring Content Groupings*

Classification	Attributes or Characteristics
Amicability (person orientation and mood)	(cooperative, uncooperative), (intimate, aloof), (trusting, distrustful), (sociable, unsociable), (personal, impersonal), (sympathetic, unsympathetic), (polite, impolite), (gay, gloomy), (generous, stingy), (equality, inequality), (pleasant, unpleasant), (patient, impatient), (adaptive, unadaptive)
Ascendancy (social dominance)	(impressive, unimpressive), (proud, self-disparaging), (successful, unsuccessful), (ostentatious, modest) (refined, coarse), (inequality, equality), (prestigeous, mediocre), (ambitious, indifferent), (dominant, submissive), (imperious, group-dependent), (aspring, acquiescent)
Control (over self and environment)	(calculating, spontaneous), (systematic, unsystematic), (serious, frivolous), (restrained, unrestrained), (cautious, impetuous), (confident, unsure), (objective, subjective), (secure, insecure), (reserved, outgoing), (stable, unstable), (formal, casual), (tight, loose), (uncontroversial, controversial)
Autonomy (personal independence)	(confident, indecisive), (individualistic, conforming), (successful, unsuccessful), (adaptive, unadaptive), (proud, self-disparaging), (strong, weak), (self-reliant, unassured), (fulfilled, unfulfilled), (freedom, hindered), (independent, dependent)
Dynamism (activity and forcefulness)	(dynamic, static), (spontaneous, calculating), (outgoing, reserved), (stimulating, uninspiring), (controversial, uncompromising), (forceful, meek), (active, passive), (bold, timid), (empatic, unemphatic), (aggressive, peaceful), (uncomfortable, comfortable), (hurried, leisurely)
Flexibility (of thought and behavior)	(innovative, unimaginative), (flexible, inflexible), (tolerant, intolerant), (open, closed), (compromising, uncompromising), (controversial, uncontroversial)
Quality (of thought, action, and environment)	(skilled, unskilled), (successful, unsuccessful), (profound, trivial), (competent, incompetent), (refined, coarse), (industrious, unindustrious), (efficient, inefficient), (reliable, unreliable), (sophisticated, naive), (sensible, unsound), (intelligent, unintelligent), (upper class, lower class)
Denotative (object characteristics)	(simple, complex), (symmetrical, asymmetrical), (heavy, light), (geometrical,), (balanced, unbalanced), (futuristic,), (uniform, varied), (angular, curved), (plain, elaborate), (regular, irregular), (thick, thin)
Reference Group (associations with groups)	(youthful, elderly), (urban, rural), (upper class, lower class), (historical, contemporary), (masculine; feminine), (futuristic,)

*Underlined attributes were selected for the Object Descriptions Task.

APPENDIX F

WORD ASSOCIATIONS TASK

Word Associations

(Contrasting Ideas)

Now I would like to have you indicate some words and phrases that you associate with ones on the attached list.

For each word on the list, write words or phrases which seem to you to express characteristics that contrast with the one listed.

Contrasting words and phrases may express characteristics which you consider desirable, undesirable, or of indeterminant desirability. Please write whatever sorts of words and phrases seem to you to contrast well with the ones on the list.

Write your answers on the answer form provided. Also, try to write your answers in the order of how directly they seem to contrast with a word listed.

1. Impersonal
2. Balanced
3. Spontaneous
4. Youthful
5. Masculine
6. Asymmetrical
7. Successful
8. Urban
9. Serious
10. Historical
11. Innovative
12. Individualistic
13. Upper Class
14. Trusting
15. Geometrical
16. Simple
17. Sociable
18. Secure
19. Dynamic
20. Controversial
21. Profound
22. Unsystematic
23. Skilled
24. Confident
25. Impressive
26. Proud
27. Reserved
28. Cooperative
29. Aloof
30. Cautious
31. Adaptive
32. Heavy
33. Futuristic
34. Restrained
35. Refined
36. Leisurely

Contrasting Ideas

Word		Word	
1	1. _____ 2. _____ 3. _____ 4. _____	10	1. _____ 2. _____ 3. _____ 4. _____
2	1. _____ 2. _____ 3. _____ 4. _____	11	1. _____ 2. _____ 3. _____ 4. _____
3	1. _____ 2. _____ 3. _____ 4. _____	12	1. _____ 2. _____ 3. _____ 4. _____
4	1. _____ 2. _____ 3. _____ 4. _____	13	1. _____ 2. _____ 3. _____ 4. _____
5	1. _____ 2. _____ 3. _____ 4. _____	14	1. _____ 2. _____ 3. _____ 4. _____
6	1. _____ 2. _____ 3. _____ 4. _____		1. _____ 2. _____ 3. _____ 4. _____
7	1. _____ 2. _____ 3. _____ 4. _____	16	1. _____ 2. _____ 3. _____ 4. _____
8	1. _____ 2. _____ 3. _____ 4. _____	17	1. _____ 2. _____ 3. _____ 4. _____
9	1. _____ 2. _____ 3. _____ 4. _____	18	1. _____ 2. _____ 3. _____ 4. _____

Contrasting Ideas

Word		Word	
19	1. _____ 2. _____ 3. _____ 4. _____	28	1. _____ 2. _____ 3. _____ 4. _____
20	1. _____ 2. _____ 3. _____ 4. _____	29	1. _____ 2. _____ 3. _____ 4. _____
21	1. _____ 2. _____ 3. _____ 4. _____	30	1. _____ 2. _____ 3. _____ 4. _____
22	1. _____ 2. _____ 3. _____ 4. _____	31	1. _____ 2. _____ 3. _____ 4. _____
23	1. _____ 2. _____ 3. _____ 4. _____	32	1. _____ 2. _____ 3. _____ 4. _____
24	1. _____ 2. _____ 3. _____ 4. _____	33	1. _____ 2. _____ 3. _____ 4. _____
25	1. _____ 2. _____ 3. _____ 4. _____	34	1. _____ 2. _____ 3. _____ 4. _____
26	1. _____ 2. _____ 3. _____ 4. _____	35	1. _____ 2. _____ 3. _____ 4. _____
27	1. _____ 2. _____ 3. _____ 4. _____	36	1. _____ 2. _____ 3. _____ 4. _____

APPENDIX G

BACKGROUND INFORMATION QUESTIONNAIRE

Name _____. Student Number _____.

Age _____. Marital Status: Single ____, Married ____.

Year in School:

Freshman ___, Sophomore ___, Junior ___, Senior ___, Other ___.

Major _____.

What is your parent's home state? _____.

Who is the main earner in your parent's family?

Father ___, Mother ___, Other ___.

What is your father's main occupation?

_____

What is your mother's main occupation?

_____

Please indicate which income range would cover your parent's total income for last year.

Under $1,000	____	7,000 to 7,999	____
1,000 to 1,999	____	8,000 to 8,999	____
2,000 to 2,999	____	9,000 to 9,999	____
3,000 to 3,999	____	10,000 to 14,999	____
4,000 to 4,999	____	15,000 to 24,999	____
5,000 to 5,999	____	25,000 and over	____
6,000 to 6,999	____		

What was the last grade (or year) your father completed in school?

College	5 years or more	____
	4 years	____
	1 to 3 years	____
High School	4 years	____
	1 to 3 years	____
Elementary	8 years	____
	5 to 7 years	____
	1 to 4 years	____
No school years completed		____

What was the last grade (or year) your mother completed in school?

College	5 years or more	____
	4 years	____
	1 to 3 years	____
High School	4 years	____
	1 to 3 years	____
Elementary	8 years	____
	5 to 7 years	____
	1 to 4 years	____
No school years completed		____

What sort of tableware do your parents have for everyday use and for best use? (check one or more)

	Everyday Use	Best Use
Stainless steel	____	____
Silver plate	____	____
Sterling silver	____	____
Other (specify)	____	____

Do you now have or have you selected the tableware design which you expect to have for a long time?

If Yes, what sort of tableware do you have or what sort have you selected for everyday use and for best use? (check one or more)

If No, what sort of tableware do you expect to eventually have for everyday use and for best use? (check one or more)

Everyday Use	Best Use		Everyday Use	Best Use
____	____	Stainless steel	____	____
____	____	Silver plate	____	____
____	____	Sterling silver	____	____
____	____	Other (specify)	____	____

If Yes in what manner did you acquire or will you be acquiring this tableware? (check one or more)

If No in what manner do you expect that this tableware will be acquired? (check one or more)

Everyday Use	Best Use		Everyday Use	Best Use
____	____	Personal purchase	____	____
____	____	Gift when married	____	____
____	____	Inherit	____	____
____	____	Other (specify)	____	____

Have you traveled in a foreign country? Yes ____, No ____.

How do you consider yourself politically?

Liberal ____, Conservative ____, Other ____.