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The Role of Cognitive Differentiation in Conceptual Systems Theory

A Thesis

Presented to the

Department of Psychology

and the

Faculty of the Graduate College

University of Nebraska

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

University of Nebraska at Omaha

by

Mary Flume

December 1, 1976

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THESIS ACCEPTANCE

Accepted for the faculty of the Graduate College, University of Nebraska, in partial fulfillment of the requirements for the degree Master of Arts, University of Nebraska at Omaha.

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The Role of Cognitive Differentiation in Conceptual Systems Theory

A cognitive approach to theory and research in personality proposes that individuals develop relatively enduring cognitive schemas for experiencing and organizing their social world. Cognitive schemas are templates through which information is filtered or transformed.

It may be understood that cognitive personality theory emphasizes the structure of cognition rather than its content. Such an emphasis is based on the assumption that structural variables are relatively enduring and invariant across situations, whereas the content of personality is expected to fluctuate markedly. Cognitive personality theory should provide the researcher with an efficient basis for describing the actions of a person and lead to a more accurate prediction of his/her behavior (Scott, 1963).

The two most frequently discussed structural variables of personality are cognitive differentiation and integration. Cognitive differentiation may be defined as the ability to look at a person, object, or event from various points of view or categories of meaning. Integration may be defined as the ability to combine a number of differentiated categories of meaning effectively and appropriately (Schroder, Driver, & Streufert, 1967). Cognitive complexity

has been defined as some optimal combination of differentiation and integration (Crockett, 1965). Unfortunately, the study of these structural variables has been plagued with difficulties due to divergent research methods, lack of comparability of personality measures, and variations in theoretical orientation (Streufert & Fromkin, 1972). A clear elaboration of their precise definition, measurement, and relationship is required to insure that the study of structural variables fulfills their promise as an efficient means for describing and predicting behavior.

Of primary concern in the present study is the specific role of cognitive differentiation as it has been discussed in three prominent cognitive theories of personality: Conceptual Systems Theory (Harvey, Hunt, & Schroder, 1961); Interpersonal Cognitive Complexity (Bieri, Atkins, Briar, Leaman, Miller, & Tripodi, 1966); and Psychological Differentiation (Witkin, Dyk, Faterson, Goodenough, & Karp, 1962). An examination of the three theoretical positions and the measuring instruments which have arisen from them leaves one with the general impression that each is discussing the same phenomenon. Nevertheless, empirical evidence shows that the measuring instruments used within these theories fail to exhibit the expected similarity (Vannoy, 1965; Harvey, Reich, & Wyer, 1968; Leitner,

Landfield, & Barr, Note 1; Brennan, Note 2). In order to reconcile this discrepancy, it first becomes necessary to examine the three cognitive theories of personality presently under consideration.

Conceptual Systems Theory

One of the most comprehensive and detailed cognitive theories is the Conceptual Systems Theory of Harvey et al. (1961). Conceptual Systems Theory proposes that each individual possesses a relatively stable conceptual system which varies along certain dimensions. Of these dimensions, concreteness-abstractness is the most important. An individual's level of concreteness-abstractness is the result of the progressive differentiation and integration of information. Differentiation refers to the "breaking up of a novel, more undifferentiated situation into more clearly defined and articulated parts," whereas integration refers to the "relating or hooking of such parts to each other and to previous conceptual standards" (Harvey et al., 1961, p. 17). Nevertheless, the progressive integration of differentiated information does not proceed at a steady linear rate, even though more abstract functioning must be preceeded by increasing differentiation and integration originating at more concrete levels of functioning. That is, differentiation alone is not sufficient to evolve a more complex conceptual system. Greater abstractness is

possible only if the differentiated parts of the conceptual system have been integrated into a higher conceptual level. A given conceptual level is thus the result of a particular degree of differentiation and integration, rather than the sum of the two processes.

Conceptual Systems Theory proposes four stages or systems which represent points on the concreteness-abstractness dimension. The lack of differentiation and integration at this stage is best denoted by the endorsement of absolute standards set by God, the parent, or conventional norms. System 1 functioning is in many ways related to the syndrome of authoritarianism (Harvey, 1966). The System 2 individual also possesses a concrete mode of thinking, but is considered to be slightly more differentiated and integrated than the System 1 representative. This individual is hostile towards, and suspicious of, all forms of authority and is guided more by rebellion towards them than by personally derived standards. The conceptual system of the System 3 individual is closer to the abstract end of the dimension in which friendship and the mutuality of relationships replaces resistance or submission to absolute standards. More than people in any other system, System 3 representatives appear to have a pervasive and indiscriminate need to be shown acceptance and approval. System 4 represents the optimal level of conceptual functioning and is at the

most abstract end of the dimension. The System 4 individual possesses the most differentiated, most integrated, and most flexible conceptual system. At this stage, mutuality and autonomy are important and are integrated so that neither interferes with the other (Harvey et al., 1961). The instrument developed to assess conceptual level of functioning is the "This I Believe" test (Harvey, Note 3).

Interpersonal Cognitive Complexity

Interpersonal Cognitive Complexity (Bieri et al., 1966) is based on Kelly's (1955) psychology of personal constructs which proposed that the movement toward greater predictability of a person's environment was a central cognitive motive in personality. Each person is thought to possess a system of constructs (characteristic modes of perception) which determine his experience of the social world. The more differentiated the construct system, the greater the predictive power of an individual. Based on these views, Bieri et al. (1966) proposed a framework in which to view the results of a variety of studies in the area of social and clinical judgment.

Cognitive structure, for Bieri et al. (1966), is best defined in terms of the simplicity-complexity dimension. Simplicity-complexity is considered to be "an information processing variable which helps us predict how an individual transforms specified behavioral information into social

or clinical judgments" (Bieri et al., 1966, p. 185). Cognitive complexity involves both differentiation (the number of independent dimensions) and articulation (the number of points within a dimension). Greater articulation would be the capacity to distinguish various shades of gray along a black-white dimension. The greater articulation and differentiation of a structure or system, the more complex the cognitive system is considered to be. In short, interpersonal cognitive complexity is viewed as the capacity to construe social behavior in a multidimensional way (Bieri et al., 1966).

The cognitively simple individual is believed to have few constructs available to construe the behavior of others. The constructs which he does possess are considered to be less articulated resulting in a generalized lack of ability to make fine discriminations of stimulus objects in the environment. The cognitively complex individual is considered to possess a greater number of constructs with which to perceive the social environment. The greater articulation of these constructs allows one to make even finer discriminations of the behavior of others. Interpersonal Cognitive Complexity assesses cognitive complexity with modifications of Kelly's Role Construct Repetory (Rep) test (Bieri et al., 1966).

Psychological Differentiation

The impetus for the theory of Psychological

Differentiation was the finding that people differ in the way they orient themselves in space (Witkin et al., 1962). This difference in spatial orientation was seen as an expression of a more general preferred mode of perceiving which was found to be linked to a variety of psychological characteristics. A particular mode determines how one experiences his or her world, body, relations with others, and sense of identity. Such characteristics refer to specific segments of behavior which fall into coherent patterns reflecting a "style of life". This led to the conclusion (Witkin, et al., 1962) that the formal, structural aspects of personality appeared to be critical in determining how people perceive themselves and their environment. They found that the concept of differentiation was best able to explain the behaviors that were found to cluster together. An unarticulated body image, poorly defined self concept, and less specialized defenses are considered to reflect less differentiation. The greater articulation, specialization, and definition of the behaviors in this cluster is believed to reflect more differentiation. Integration as a formal aspect of personality was considered to be unable to distinguish between individuals with different perceptual styles.

One of the two major aspects of psychological differentiation is specialization of function. The more

differentiated individual has subsystems available which perform specific functions. In the less differentiated individual, these functions are performed by the system as a whole. The second aspect of differentiation is segregation, which is the clear separation of what is considered as belonging to the self and that which is considered as external to the self. The undifferentiated person is referred to as field dependent; the differentiated individual is referred to as field independent.

Integration refers to the pattern of relationships between the system components and between the system and the environment. Witkin et al. (1962) distinguishes two types of integration: effective and complex.

> To say that integration is effective means that there is a more or less harmonious working together of system components with each other and of the total system with its environment, thereby contributing to the adaptation of the organism . . . To say that integration is complex means that the relationships among system components and between the system and its environment are elaborate. (p. 10)

The extent of differentiation has implications for the way in which a system is integrated. The more

differentiated system is likely to be more complexly integrated because greater differentiation must be accompanied by more complex reintegrations of the system. However, the level of differentiation is not related to effective integration. At any level of differentiation, it is possible to have either effective or ineffective integration of the system (Witkin et al., 1962).

The field dependent individual is guided by the surrounding visual field in perception rather than by sensations within the body, independent of the visual field. Such individuals display less well articulated conceptions of their own bodies, feelings, and motives. The field independent person has a highly articulated body concept and a well developed sense of separate identity with distinct emotions, attributes, and needs, which are segregated from the nonself. However, the field independent individual is not always the most well adjusted. Witkin et al. (1962) point out that "although field-independent people are often able to function with a fair degree of autonomy from others, some of them are strikingly isolated individuals, overcontrolled, cold and distant, and unaware of their social stimulus value" (p. 3). The Embedded Figures Test is the major instrument used to assess the extent of differentiation (Witkin, Oltman, Raskin, & Karp, 1971).

The Role of Differentiation

Prior to an examination of the similarities and differences in these three theoretical approaches, it is necessary to deal with the question of whether it is possible to separate differentiation from integration in the measurement process. It has been suggested that such an attempt would be unrealistic and inappropriate (Langley, 1971), while others have suggested that the two processes are separate (Schroder & Suedfield, 1971) although probably correlated to some extent (Schroder et al., 1967; Harvey et al., 1961). Furthermore, it has been shown that a number of measures of integrative complexity define a factor which is not defined by measures of differentiation (Gardiner, 1968). Similarly, Vannoy (1965) found the properties of differentiation and integration to be factorially independent.

Although it appears that differentiation and integration are two distinct processes, it has been recognized that some optimal combination of both is required to obtain a high level of cognitive complexity (Crockett, 1965; Lietner et al., Note 1). This is best exemplified by Bannister and Mair (1968) who have shown that severely thought-disordered schizophrenics are highly differentiated, yet lack the necessary integration required for effective interaction with the environment.

Conceptual Systems Theory proposes four levels of

increasing integration accompanied by increasing differentiation. This is based on the assumption that differentiation is a necessary but insufficient condition for integration. Therefore, it is possible for a highly differentiated individual to lack the necessary integration required for a high level of conceptual functioning. On the other hand, Interpersonal Cognitive Complexity (Bieri et al., 1966) does not concern itself with integration. It views cognitive complexity as simply a matter of increasing differentiation. Similarly, the Psychological Differentiation theory of Witkin et al. (1962) places major emphasis on differentiation. However, it does recognize that integration plays a role. Increasing differentiation is associated with increasing complex integration (elaborate relationships between the system and the environment). However, increasing differentiation is unrelated to effective integration (harmonious relationships between the system and environment), the sort of integration which Conceptual System Theory is apparently discussing. The Psychological Differentiation theory (Witkin et al., 1962) does not claim to be measuring conceptual level, cognitive complexity, or adaptation, but simply measuring increasing differentiation.

It is assumed here that the Embedded Figures test and the Rep test do indeed measure increasing differentiation as their authors suggest. It is also assumed that the This I Believe test measures increasing integration as its

authors assume. However, it is suggested that the type of integration it is measuring, to use Witkin's terminology, is effective integration. Because effective integration is unrelated to the level of differentiation (Witkin et al., 1962), the assumption that the This I Believe test is also measuring increasing differentiation (Harvey et al., 1961) may be unfounded. It is contended, as Harvey et al. (1961) have indicated, that differentiation is a necessary but insufficient condition for integration. But, it is only complex integration, once again using Witkin's terminology, that requires differentiation as a necessary condition. It is possible for an effectively integrated individual to be only minimally differentiated. Therefore, if the assumption made here is correct, any level of differentiation is possible in each of the four conceptual systems. It is contended here that Systems 1 and 3 are the least differentiated and Systems 2 and 4 are the most differentiated.

This view of differentiation and the four conceptual systems is a considerable departure from the conception of Harvey et al. (1961). However, much theoretical and empirical support for it exists. Descriptions of low differentiators by Witkin et al. (1962) include a variety of characteristics which correspond to descriptions by Harvey et al. (1961) of individuals classified as System 3. For example, Witkin et al. (1971) describes less differentiated individuals as "more likely to attend to and

therefore learn more about social aspects of their environment" (p. 13) and to exhibit "reliance on external sources for definition of their attitudes, judgments, sentiments, and their views of themselves" (p. 8). Harvey (Note 3) characterizes the System 3 individual as follows: "the most central concerns of the System 3 person center around manifesting socially desirable behavior and through this of attaining personal acceptance and approval of themselves . . ." (p. 14). As has been previously mentioned, Witkin et al. (1962) reports some highly differentiated individuals to be "strikingly isolated individuals, overcontrolled, cold and distant, and unaware of their social stimulus value" (p. 3). Harvey (Note 3) views the System 2 individual as "being the highest in cynicism, anomie, and alienation and the lowest in self esteem" (p. 12).

Empirical evidence also supports the predicted system differences in differentiation. In this regard, Harvey et al. (1968) failed to find differences between combined Systems 1 and 2 and combined Systems 3 and 4 on a measure of differentiation. Since this particular study dealt with a number of different variables, it is unclear as to whether the results provide evidence for the predicted system differences suggested here. Nevertheless, Harvey (1966) has reported in another study that the four systems showed increasing complexity on a modified Rep test.

However, he failed to report whether any of the differences were significant. Others have found essentially zero correlations between the Rep test scored for differentiation and the This I Believe test: r_s = .02 and .08 (Lietner et al., Note 1). Still other measures of conceptual systems like the Paragraph Completion Test result in low correlations with Rep test procedures (Vannoy, 1965).

The present study was designed to provide a more complete examination of the role of cognitive differentiation in Conceptual Systems Theory. This role was assessed in the light of the present formulation; that Systems 1 and 3 are the low differentiators and Systems 2 and 4 are the high differentiators. This was done in the hopes that such a formulation might clarify some of the discrepant findings that have been reported in the study of measures of differentiation.

Measures of Differentiation

The particular differentiation measures used in this study included two types: perceptual and interpersonal. The rationale for the use of a strictly perceptual measure of differentiation, the Embedded Figures test, was twofold. First, it is very likely that perception plays a significant role in interpersonal judgment. Consequently, one might expect that although the Embedded Figures test and the Rep test appear to be quite different, the interpersonal ratings of significant others, as required by the Rep test,

is probably a function of fundamental perceptual processes. That is, the extent to which an individual's perceptual processes are differentiated should determine the extent to which one's interpersonal perceptions are differentiated. This is evidenced by the extensive work done by Witkin and his associates in establishing an empirical relationship between the Embedded Figures Test and estimates of personality and psychopathology (Witkin et al., 1971). The second reason for the use of the Embedded Figures test and estimates of personality and psychopathology (Witkin et al., 1971). The second reason for the use of the Embedded Figures test is that it is purported to be free of effective integration (Witkin et al., 1962). It is believed that an unconfounded measure of differentiation is likely to help clarify some of the ambiguities surrounding the six measures of differentiation extracted from the Rep test employed in this study. It should thus be possible to determine the relationship between a perceptual measure and interpersonal measures of differentiation and to assess the latter against a technique free of effective integration. The four interpersonal measures of differentiation extracted from the Rep test in this study will be enumerated below.

In summary, the following hypotheses were proposed:

1. The five measures of differentiation will be significantly related.

2. Representatives of Systems 1 and 3 will be the least differentiated and Systems 2 and 4 will be the most differentiated.

Method

Subjects

The participants in this study were 70 undergraduate and graduate students at the University of Nebraska at Omaha. These individuals were selected from a larger population (approximately 200 people) on the basis of level of conceptual functioning as measured by the This I Believe test. In the final sample, there were 20 representatives each for Systems 1 and 4 and 15 representatives each for Systems 2 and 3. The breakdown for the four systems in terms of sex and mean age was as follows: System 1, 5 males ($\bar{X}$ = 22.4) and 15 females ($\bar{X}$ = 20.93); System 2, 8 males ($\bar{X}$ = 20.625) and 7 females ($\bar{X}$ = 22.14); System 3, 2 males ($\bar{X}$ = 32) and 13 females ($\bar{X}$ = 24.375); and System 4, 8 males ($\bar{X}$ = 24.375) and 12 females ($\bar{X}$ = 25.75). These people either participated on a voluntary basis or received course credit for doing so.

Measures

This I Believe test. The instrument developed by Harvey (1966) to assess conceptual level is the This I Believe test. The test booklet is composed of 10 statements, each on a separate sheet, beginning with "This I believe about . . . " followed by a concept referent. The blank

is filled by one of the following concept referents: the American way of life; religion; people; marriage; friendship; sin; rules; revenge; lying; and calling a teacher by his/her first name. The individual is required to write at least two sentences on each topic. The initial five concept referents have a 2 minute time limit and the remaining five have a limit of 1 minute and 45 seconds. The booklet is scored according to the four conceptual systems of Harvey et al. (1961) on the basis of the presence or absence of a number of characteristics (e.g. degree of absolutism; ethnocentricity; dependency on external authority). Responses to items are not scored independently, rather, the test is assessed in its totality to provide a context for a better understanding of the separate responses. The scorer is required to be as concerned with a global impression as with specific content (Harvey, Note 3). The question of reliability is important because of the subjective nature of the scoring system. Harvey (Note 3) reports an interjudge reliability of .91 when scored by trained readers. In regard to test-retest reliability, Greaves (1971), using the same subjects, reports a stability coefficient of .94 for a nine week time lapse and Harvey and Felknor (1970) report a coefficient of .85 for an eight month time lapse for the same subjects. A variety of studies providing adequate construct validity are presented in Harvey (1966). For example, System 1 individuals

consistently score the highest on authoritarianism scales, followed in order by Systems 3, 2, and 4.

Group Embedded Figures test. The Group Embedded Figures test is a group form of the individual Embedded Figures test developed by Witkin et al. (1971) for use with large groups of subjects. The individual is required to identify and trace a simple geometrical figure embedded in a more complex geometrical design. The Group Embedded Figures test contains three sections. The first section contains seven simple items with a 2 minute time limit designed to provide the participant with practice with the format of the test. The second and third sections each contain nine more difficult items with a 5 minute time limit per section. The simple geometrical figures are on the back cover of the booklet to prevent the individual from seeing the simple figure and the complex figure simultaneously. However, the subject is allowed to refer to the back cover as often as he/she chooses. A scoring key is used to assess the total number of simple forms correctly traced in the second and third sections of the test and this constitutes the total score. The Group Embedded Figures test can be used in place of the Embedded Figures test because parallel form reliability estimates compare favorably, .82 for males and females, (Witkin et al., 1971). To provide evidence for validity, Witkin and his associates (1971) compared the Group Embedded

Figures test with three criterion variables: the individual Embedded Figures test; the portable Rod and Frame test; and a measure of differentiation which assesses the degree of body articulation. The authors conclude that the Group Embedded Figures test has adequate validity.

Rep test. The test used to measure interpersonal cognitive complexity in this study was a modification of the Tripodi and Bieri (1963) Rep test developed by Millimet (Note 4). This test is discussed here in detail because it differs in a number of ways from other modified Rep tests. This test consists of a 12 X 26 grid in which the columns are 12 role categories (e.g. yourself, mother, most interesting person you know, person you dislike) and the rows are 26 provided bipolar personality trait dimensions (e.g. shy-outgoing). The individual selects persons known to him that fit the role models and then rates each person on each of the 26 bipolar trait dimensions using a 7-point Likert-type scale with 4 as a neutral point. The 26 personality trait dimensions are the result of a factor analysis of 150 bipolar personality trait dimensions in which seven factors emerged (Millimet, Note 4). Two of these factors corresponded to the "activity" and "potency" factors of the semantic differential (Osgood, Suci, Tannenbaum, 1957). These two factors are labeled extraversion and physical strength respectively. The traditional "evaluative" factor emerged as five separate factors; all

evaluative yet referring to different realms of interpersonal behavior. These five factors are labeled: person orientation; task orientation; uniqueness; anxiety; and authoritarianism. The 26 bipolar trait dimensions on this Rep test reflect these seven factors (see Appendix I).

The design of this Rep test provides a wealth of information not available with the use of more traditional methods. It is possible to obtain four measures of differentiation. The first index is the average intercorrelation of all seven trait factors and is called the between trait factor correlation. The degree of correlation between any two factors reflects whether the individual is using the two factors identically and therefore should reflect his/her degree of differentiation. The second index of differentiation is the average within factor intercorrelation and is called the within trait factor correlation. This represents the amount of differentiation an individual exhibits with the factors. For the group this should be large given the underlying factor structure but for any given individual, it could be small or large depending on the extent of differentiation of his/her conceptual system. The third index of differentiation is the overall average standard deviation of the ratings. This score reflects the use of the numbers on the rating scale and has been suggested by Cronbach (1955) as the best measure of differentiation. The fourth index

of differentiation from the Rep test is the person differentiation score. This value reflects the average intercorrelation of the ratings of the 12 role categories. The degree of correlation between ratings of any two significant people is assumed to reflect the extent to which the individual discriminates between other people.

It is also possible to obtain profile analyses of the four systems based on the 21 possible correlations among the seven trait factors. This involves selecting any two factors (e.g. extraversion and authoritarianism) and determining if there are system differences by using the Median test. A second type of profile analysis can also be performed by using the trait factor superordinancy scores which can be elicited from the Rep Test. These scores reflect the rank ordering of the seven trait factors in terms of their relative degree of centrality in a person's conceptual system. The factor with the highest score is the more superordinate and it is thus possible to determine if system differences exist in terms of this most central factor.

In light of the fact that this Rep test is a newly developed technique, an attempt was made to insure reliability within the study. This invoved strengthening the factor structure for this group of people. This was done by selecting the two pairs of bipolar adjectives representing each factor which were most highly

intercorrelated and the least correlated with the other factors. These pairs of adjectives were then used in the final analysis (see Appendix II). Millimet (Note 4) has obtained test-retest reliability of .89 for a similar list of adjectives.

Procedure

Groups of individuals were administered the This I Believe test until the 70 subjects were selected. A person's selection was based on the agreement of at least three out of six trained judges although, in many cases, the percentage agreement was much higher. The fact that the final 70 subjects were selected out of a larger population of 200 subjects indicates that a strong attempt was made to only include "pure" representatives from each conceptual system. If an individual was considered to be a mixture of two or more systems or if agreement could not be reached, the person was not included in the study. Random assignment of subjects was made to one of the following two conditions. In the first condition, the individual was administered the Rep test followed by the Group Embedded Figures test. In the second condition, the individual was administered the Rep test followed by the Group Embedded Figures test. No differences were found between the two conditions. After the experiment, all participants were debriefed as to the purpose and nature of the study and were thanked for their time and cooperation.

Results

Intercorrelations Among the Differentiation Measures

The initial computation entailed calculating the correlations among the five measure of differentiation across all 70 subjects in the four systems. The correlation matrix is shown in Table I. The correlations which reflect the relationship between the four measures of differentiation on the Rep test were significant and in the predicted direction. All were positive except for the standard deviation measure in which a larger score reflects more differentiation so it is negatively correlated with the other three measures in which higher scores reflect less differentiation. The correlations between scores on the Group Embedded Figures test and the measures of differentiation on the Rep test were also negative since higher scores on the Group Embedded Figures test reflect increasing differentiation.

Differentiation and Conceptual Level

Assessment of the relationship between differentiation measures and conceptual level involved performing five one way analyses of variance. Only one of these analyses, that using the standard deviation scores as the dependent

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Insert Tables II - VII about here

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measure, reflected the formulation presented here. In

this analysis, $F(3,66) = 2.696$, $p = .053$. The other analyses failed to result in significant differences between systems. The planned comparisons which contrasted combined Systems 1 and 3 with combined Systems 2 and 4 showed marginal significant differences between groups when the between trait factor correlation, $t\ (66) = 1.893$, $p = .063$ and standard deviation, $t\ (66) = 2.711$, $p = .009$, were the criteria. Other planned comparisons contrasting System 1 with System 4 also resulted in the following significant differences between groups when the between trait factor correlation, $t\ (66) = 2.38$, $p = .02$; the standard deviation, $t\ (66) = 2.42$, $p = .018$; and person differentiation, $t\ (66) = 2.21$, $p = .031$, were the criteria. All comparisons involved use of the pooled variance estimate.

Profile Analyses

The first profile analysis involved a comparison of the four systems on each of the 21 possible correlations between factors. For example, Factor I (person orientation) was compared with Factor II (task orientation). These between trait factor correlations for all subjects were found and the median calculated. Each individual was classified as above or below the median and the four systems were compared using the Median test. This test is designed to ascertain whether they have been drawn from populations with the same median. This resulted in 21 separate tests.

Because of the number of tests, it was likely that significant differences would occur simply on the basis of chance. While this is a consideration, the significant findings almost all involve System 4 and Factor VII (authoritarianism) and are consistent with results of Harvey (1966). System 4 individuals had significantly fewer scores above the median when the following factors were compared: person orientation and authoritarianism ($p = .058$); task orientation and authoritarianism ($p = .006$); uniqueness and authoritarianiam ($p = .021$); and anxiety and authoritarianism ($p = .006$). The only other significant finding involved System 2 individuals who had fewer scores above the median when person orientation and authoritarianism were the factors ($p = .018$).

The second profile analysis was designed to assess the relationship between trait factor superordinancy scores and conceptual level. These scores reflect the rank order of the seven trait factors in terms of their centrality in an individual's conceptual system. The four conceptual systems were compared in terms of these scores to determine whether there were system differences in most central trait factor. This involved an analysis of variance with repeated measures in which the relationship between the seven trait factors and conceptual level was assessed. The only significant effect was the main effect for the trait factors, $F (6,396) = 6.22$, p .01.

That is, across all subjects, the trait factors differed

Insert Table VIII about here

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in terms of which were more central. The following examination of the means for the seven levels of the trait factors reflects their rank ordering in terms of contrality: physical strength ($\bar{X}$ = 14.128); anxiety ($\bar{X}$ = 14.044); extraversion ($\bar{X}$ = 13.693); person orientation ($\bar{X}$ = 13.194); task orientation ($\bar{X}$ = 13.168); authoritarianism ($\bar{X}$ = 13.128); and uniqueness ($\bar{X}$ = 12.723).

Discussion

The high correlations between the four measures of differentiation on the Rep test is a somewhat expected result in that they are derived from the same data. It would also be expected that person differentiation would be related to construct differentiation within an individual. The Group Embedded Figures Test was also significantly correlated with three measures of differentiation on the Rep test; the highest correlation (r = -.31) was with person differentiation reflecting a relationship between perceptual measures and interpersonal measures of differentiation; specifically those interpersonal measures which reflect the degree to which an individual discriminates between significant others. However, the lack of

correlation between the Group Embedded Figures test and the standard deviation (the best measure of differentiation in the present study) indicates that this perceptual measure of differentiation and construct differentiation have separate and distinct components. Given that the Group Embedded Figures test is a pure measure of differentiation (free of effective integration), as Witkin et al. (1962) suggest, the Rep test measures may be contaminated somewhat by effective integration which resulted in a decreased relationship.

Cronbach's (1955) conclusion that the standard deviation is the best measure of differentiation was supported in the present study. This index of differentiation reflects articulation as discussed in Bieri et al.'s (1966) Interpersonal Cognitive Complexity. Specifically, the standard deviation represents an individual's ability to make fine discriminations within a given dimension. Since the other three measures of differentiation from the Rep test failed to result in significant differences between the four systems, it is likely that comparisons of relationships between factors is not a fruitful way to assess extent of differentiation. The fact that the Group Embedded Figures test failed to result in significant differences between conceptual systems raises questions as to its use as a measure of interpersonal differentiation.

While the results of the present study are far from conclusive, they certainly provide some evidence for the prediction that Systems 1 and 3 are less differentiated than Systems 2 and 4. The fact that three of the planned comparisons contrasting combined Systems 1 and 3 with combined Systems 2 and 4 resulted in significant differences definitely raises questions concerning Harvey et al.'s (1961) original formulation of the order of the four conceptual systems in terms of differentiation. Further studies, particularly ones incorporating integration, are required to provide a definitive answer.

In the first profile analysis, System 4 individuals were found to have significantly fewer high correlations above the median when Factor VII (authoritarianism) was compared with Factors I, II, IV, and V (person orientation, task orientation, uniqueness, and anxiety, respectively). This finding reflects the fact that these factors are relatively unrelated in the System 4 individual's conceptual system as compared to the individuals in the other three conceptual systems. Factor VII involves an individual's perception of the religiosity and patriotism of another person. The results here suggest that whatever the perception is, it is unrelated to one's perception of another person's orientation towards others or towards a task and another's uniqueness and anxiety. This finding for the System 4 person is in agreement with Harvey et al.'s

(1961) characterization of this system type. However, complete consistency with Harvey et al.'s (1961) formulation would have required that System 1 individual's exhibit the opposite results. These individuals should have displayed strong relationships between authoritarianism and the other factors. The other significant effect was that System 2 individuals were found to have fewer scores above the median when person orientation and authoritarianism were the factors compared. This finding tends to disagree with Harvey et al.'s (1961) characterization of the System 2 person. Their profile would suggest that these two factors would be related. The System 2 person who is generally anti-religious and unpatriotic should, according to Harvey (1966), have his perception of another person's orientation to people influenced by his perception of their degree of religiosity and patriotism. These findings contradict this view. One possible explanation is that the System 2 individual is more differentiated than the original formulation indicated. However, it is also possible that given the number of tests, this is a chance effect. Overall, this profile analysis failed to be an objective means of determining conceptual system types.

The second profile analysis compared conceptual system type with trait factor in terms of trait factor superordinancy scores and resulted in a significant main

effect for trait factor. That is, across all subjects, the trait factors had varying degrees of superordinancy or centrality. While it is secondary to the study here, it is surprising that physical strength was found to be the most central trait factor for people in general. The fact that uniqueness was the least central trait factor for people in general is perhaps best explained by a general lack of understanding as to what the bipolar adjectives representing this factor (average - unique; common - uncommon) mean in relation to people (Millimet, Note 4). It was hoped that this profile analysis would provide an objective means of determining conceptual system type. The lack of a significant interaction precluded this use.

In conclusion, the results of the present study provide some limited evidence that the four conceptual systems of Harvey et al. (1961) show increasing differentiation in the following order: System 1, System 3, System 2, and System 4. Three analyses found System 1 people to be significantly less differentiated than System 4 people. Two analyses found combined Systems 1 and 3 individuals to be significantly less differentiated than combined Systems 2 and 4 individuals. Finally, one analysis found the conceptual systems to display increasing differentiation in the following order: 1, 3, 2, 4. The profile analyses failed to provide an objective means for determining

conceptual system type.

The fact that the System 2 individual tended to be more differentiated than the System 3 individual on one measure might provide some insight into the the reasons behind the low correlations between measures of conceptual systems and measures of differentiation. However, in terms of cognitive complexity, which is some optimal combination of both integration and differentiation, it is probable that the conceptual systems follow the order in the original formulation (Harvey et al., 1961). A complete understanding of these two processes and their interaction requires the development of adequate measures of integration.

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	Between Trait Factor Correlation	Within Trait Factor Correlation	Standard Deviation	Person Differentiation	Embedded Figures Test
Between Trait Factor Correlation		.55**	-.82**	.98**	-.29*
Within Trait Factor Correlation			-.47**	.63**	-.18
Standard Deviation				-.80**	-.13
Person Differentiation					-.31*
Embedded Figures Test					

Table I. A Correlational Matrix including different measures of cognitive differentiation.

* $p < .05$
** $p < .001$

Table II

Means and Standard Deviations of Cognitive Differentiation for each Conceptual Level

Differentiation Measure		Conceptual Level			
		1	2	3	4
Between Trait Factor Correlation	$\bar{X}$	15.45	12.98	13.37	12.62
	SD	4.77	3.50	1.98	3.05
Within Trait Factor Correlation	$\bar{X}$	22.82	20.57	21.37	20.64
	SD	5.73	5.60	5.16	4.99
Standard Deviation	$\bar{X}$	1.28	1.45	1.30	1.49
	SD	.30	.26	.19	.31
Person Differentiation	$\bar{X}$	20.08	16.71	17.29	16.65
	SD	6.42	4.70	2.72	5.30
Embedded Figures Test	$\bar{X}$	11.70	11.20	12.27	12.95
	SD	3.91	4.80	4.06	4.20

Table III

An Analysis of Variance of Between

Trait Factor Scores for Conceptual Level

Source	SS	df	MS	F
Between	1.41	3	.47	2.292*
Within	13.55	66	.21	
Total	14.96	69		

* p = .086

Comparisons

	Value	S. Error	df	T Value	T prob.
Contrast 1 Groups 1 and 2 vs Groups 3 and 4	.134	.109	66	1.223	.226
Contrast 2 Groups 1 and 3 vs Groups 2 and 4	.207	.109	66	1.893	.063
Contrast 3 Group 1 vs Group 4	.341	.143	66	2.38	.020

Table IV

An Analysis of Variance of Within Trait Factor Scores for Conceptual Level

Source	SS	df	MS	F
Between	62.40	3	20.80	.720*
Within	1907.21	66	28.90	
Total	1969.61	69		

*p = .544

Comparisons

	Value	S. Error	df	T value	T prob.
Contrast 1 Groups 1 and 2 vs Groups 3 and 4	.692	1.298	66	.533	.596
Contrast 2 Groups 1 and 3 vs Groups 2 and 4	1.494	1.298	66	1.151	.254
Contrast 3 Group 1 vs Group 4	2.186	1.700	66	1.286	.203

Table V

An Analysis of Variance of Standard Deviation Scores for Conceptual Level

Source	SS	df	MS	F
Between	.61	3	.20	2.696*
Within	5.00	66	.08	
Total	5.61	69		

*p = .053

Comparisons

	Value	S. Error	df	T value	T prob.
Contrast 1 Groups 1 and 2 vs Groups 3 and 4	-.030	.066	66	-.458	.648
Contrast 2 Groups 1 and 3 vs Groups 2 and 4	-.18	.066	66	-2.711	.009
Contrast 3 Group 1 vs Group 4	-.211	.087	66	-2.42	.018

Table VI

An Analysis of Variance of Person Differentiation Scores for Conceptual Level

Source	SS	df	MS	F
Between	199.23	3	66.41	2.022*
Within	2167.81	66	32.85	
Total	2367.04	69		

*p = .119

Comparisons

	Value	S. Error	df	T Value	T prob.
Contrast 1 Groups 1 and 2 vs Groups 3 and 4	1.536	1.384	66	1.110	.271
Contrast 2 Groups 1 and 3 vs Groups 3 and 4	2.469	1.384	66	1.784	.079
Contrast 3 Group 1 vs Group 4	4.005	1.812	66	2.210	.031

Table VII

An Analysis of Variance of Embedded Figures Test Scores for Conceptual Level

Source	SS	df	MS	F
Between	30.16	3	10.05	.563*
Within	1178.48	66	17.86	
Total	1208.64	69		

*p = .641

Comparisons

	Value	S. Error	df	T Value	T prob.
Contrast 1 Groups 1 and 2 vs Groups 3 and 4	-1.158	1.021	66	-1.135	.260
Contrast 2 Groups 1 and 3 vs Groups 2 and 4	-.092	1.021	66	-.090	.929
Contrast 3 Group 1 vs Group 4	-1.250	1.336	66	-.935	.353

Table VIII

An Analysis of Variance of Trait Factor Superordinancy Scores For Trait Factor and Conceptual Level

Source	SS	df	MS	F
A (Conceptual Level)	324.589	3	108.196	1.54
S(A)	4625.568	66	70.084	
B (Trait Factor)	112.951	6	18.825	6.22*
A X B	60.587	18	3.366	1.11
S(A)B	1198.139	396	3.026	

*$p < .01$

Appendix I

Factors and Bipolar

Adjective Representatives On the Rep Test

Factor I - Person Orientation
- Inconsiderate - Considerate
- Thoughtless - Thoughtful
- Insincere - Sincere
- Unsympathetic - Sympathetic

Factor II - Task Orientation
- Disorganized - Organized
- Inefficient - Efficient
- Careless - Careful
- Lazy - Industrious

Factor III - Extraversion
- Shy - Outgoing
- Silent - Talkative
- Introverted - Extraverted
- Passive - Active

Factor IV - Uniqueness
- Typical - Uncommon
- Average - Unique
- Ordinary - Unusual
- Simple - Complex

Factor V - Anxiety
- Tense - Relaxed
- Nervous - Calm
- Worried - Carefree
- Excitable - Easygoing

Factor VI - Physical Strength
- Feeble - Rugged
- Frail - Hardy
- Powerless - Powerful
- Weak - Strong

Factor VII - Authoritarianism
- Unpatriotic - Patriotic
- Irreligious - Religious

Appendix II

Bipolar Adjectives

Used In the Final Analysis

Factor I - Person Orientation
- Inconsiderate - Considerate
- Thoughtless - Thoughtful

Factor II - Task Orientation
- Disorganized - Organized
- Inefficient - Efficient

Factor III - Extraversion
- Shy - Outgoing
- Silent - Talkative

Factor IV - Uniqueness
- Typical - Uncommon
- Average - Unique

Factor V - Anxiety
- Tense - Relaxed
- Nervous - Calm

Factor VI - Physical Strength
- Feeble - Rugged
- Frail - Hardy

Factor VII - Authoritarianism
- Unpatriotic - Patriotic
- Irreligious - Religious