COMPLEXITY, CREATIVITY, AND SOCIAL DESIRABILITY: CONSTRUCT VALIDATION OF THE CRANO-BETTINGHAUS MEASURE

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ABSTRACT

COMPLEXITY, CREATIVITY, AND SOCIAL DESIRABILITY: CONSTRUCT VALIDATION OF THE CRANO-BETTINGHAUS MEASURE

By

Alida Diane Quick

The present research attempted to validate a new measure of cognitive complexity--the Crano-Bettinghaus instrument. The instrument was deemed to be a precise, expedient measure of differentiation, and a reasonable indicator of the generality of complexity across stimulus domains.

The validation procedure consisted of constructing a multitrait-multimethod matrix of intercorrelations between the Crano-Bettinghaus measure and several other complexity tests, as well as several purportedly related measures of creativity and social desirability. The protocols of 123 subjects were used in constructing the matrix.

It was hypothesized that the measures of complexity would have a high positive relationship with each other,

and with measures of creativity. The social desirability measures were expected to have a high negative relationship with the complexity measures.

The results failed to provide support for the validity of the Crano-Bettinghaus measure. Although a few cases of significance were reported, the data overall were not significantly different from zero. None of the predicted relationships were reasonably substantiated.

The lack of convergence among measures of complexity and the consequent absence of relationship between measures of complexity, creativity, and social desirability were attributed primarily to a basic theoretical void in defining the relationship between the complexity components of integration and differentiation. The possibility that this relationship was nonlinear, thereby reducing the obtained correlations was considered. Methodological error and possibly confounding sex and content variables were also implicated. It was suggested that specification of the integration-differentiation distinction is imperative to the future development of complexity theory.

Approved: William D. Crano

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By

Alida Diane Quick

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To my parents

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TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

Although relatively well known as an area of psychological inquiry, the study of human cognition and thought has recently become the object of extensive and often fruitless experimentation. Significant theoretical advances have been made, however, including an increasing body of evidence advocating the existence of systematic individual differences in structuring and organizing information. Research in this area (usually restricted to the interpersonal arena) constitutes the domain of a rather recent theoretical construct--cognitive complexity.

Cognitive complexity has been interpreted in a variety of interesting and often conflicting ways. All of the interpretations recognize that: a) There are systematic differences in the processing of information which are in some way related to an ability to differentiate cues. b) More advanced levels of differentiation are generally associated with higher levels of complexity; less advanced levels are associated with lower levels of

complexity. (The distinction is often made using the terms cognitively complex or abstract and cognitively simple or concrete, although theoretically a continuum permitting assessment on a number of levels is generally postulated.) c) These differences are presumed to be associated with other personality dimensions.

The Concept of Complexity

A relatively minor line of complexity research may be traced to Barron's 1953 study which involved finding correlates of subjects' preference for simple or complex line drawings. Barron described "a bipolar factor which opposes preference for perceiving and dealing with complexity to a preference for perceiving and dealing with simplicity," and noted that both Welsh (1949) and Eysenck (1941) had previously identified a similar factor. Barron reported that preference for complex figures correlated positively with personal tempo, verbal fluency, impulsiveness, originality, independency of judgment, etc., and negatively with rigidity, repression, authoritarianism, etc.

Another conception originated with Gardner (1953) who coined the term "equivalence range," which was implicitly defined as "the span or realm of objects, qualities, and so on, which subjects are willing to subsume under one conceptual rubric as being the same." A similar variable "category width" was identified by Pettigrew (1958), and described as a tendency to be consistently broad, medium, or narrow in the use of category ranges.

The descriptions developed by the "response style" theorists represent serious attempts to categorize cognitive behavior. Although these characterizations are related to complexity, the initial theoretical impetus for complexity formulations is generally credited to G. A. Kelly (1955) and his student James Bieri (1955).

Kelly devised one of the most elaborate cognitive personality theories. As a part of his theory he provided several versions of the Role Concept Repertory (REP) test, intended to discover the constructs and contrasts (roughly dimensions) used by persons in evaluating and predicting experience. Though Kelly as a clinician was largely concerned with the content of a person's constructs, he did provide for a "nonparametric factor analysis" of one form of the REP test (Kelly, 1955) intended to evaluate the

independence of dimensions, or the complexity of cognitive structure. The procedure was tedious and a much simpler measure of complexity was used by Bieri (1955) in an early study relating complexity to accuracy of interpersonal prediction.

Bieri's conception of complexity is embedded in observations of the range of response versatility exhibited by human subjects. He was primarily concerned with the way in which individuals perceive their social worlds. He postulated that the structure of one's social world is most directly influenced by the structure of one's cognitive system, and more specifically by the complexity of that system. Bieri (1961) concluded that different degrees of differentiation in people's construct systems was responsible for the versatility of response. The more complex or differentiated person possesses a more adaptive response repertory and is capable of making finer discriminations in social judgment.

Bieri (1955) constructed what has become one of the most common methods for assessing the degree of complexity, the row matching technique (adapted from Kelly's REP test). This technique (revised in 1956) is based on a definition of differentiation as the relative number of

dimensions used by a judge in construing others. The subject is presented with a matrix across the top of which he is asked to write in the names of certain persons (parents, relatives, friends, etc.). The rows of the matrix contain bipolar trait dimensions such as outgoing-shy and adjusted-maladjusted. The subject is required to rate each person on each of the dimensions using a six-category scale.

By considering how similar each construct row is to every other construct row in terms of ratings, a measure of differentiation is obtained. If the subject has many construct rows with highly similar ratings he is considered to have low cognitive complexity. If the matrix generated has markedly different ratings he is high in complexity. It is assumed that the number of constructs and degree of differentiation correlate highly, therefore the measure reflects cognitive differentiation.

Another important theoretical position to be considered is one introduced by Harvey, Hunt, and Schroder (1961), which has been extended more recently by Schroder, Driver, and Streufert (1967) and Harvey (1966). These authors have elaborated the term "conceptual systems" into a fairly thorough approach to complexity which is theoretically distinct from Bieri's by virtue of the inclusion of

integration as a basic complexity component. Integration generally relates to the degree of organization of cognitive components into interdependent systems.

Harvey, Hunt, and Schroder (1961) suggest a continuum labeled "concrete-abstract." They describe only seven positions along this dimension, but explicitly state that admixtures of the major systems are prevalent. The "This I Believe" (TIB) test devised by Harvey et al. (1961) is used extensively in their studies. Subjects are required to complete the sentence stem "This I believe about . . . ," indicating their beliefs about relevant concepts (marriage, religion, sin, etc.). Classification of subjects by content analysis into the various systems is based on such things as absolutism of beliefs, dependence on external authorities, and degree of ethnocentrism.

Harvey (1966) theorized that there are major qualitative changes in behavior as a person moves through four major stages of abstractness. At least two characteristics are readily identifiable, namely differentiation and integration, the former progressing through the first three systems (levels of concreteness-abstractness), and the latter being the major distinction between the third and fourth systems. Harvey's systems approach assumes

that cognitive structures evolve from an initial state of undifferentiation in a stage-like process to a state of relative abstractness. The attained level of abstractness is determined by childhood training experiences.

Schroder, Driver, and Streufert (1967) present a different situation. Although one might expect their theory to be similar to Harvey's in that both descend from Harvey, Hunt, and Schroder (1961), and in spite of an implied acceptance of similarity on the part of the principles, there are basic differences. Schroder et al. (1967) distinguish between dimensionality and integration, state that there is no necessary relationship between the two, and thenceforth restrict their attention almost exclusively to integration.

Schroder et al. describe four levels, but indicate that these are merely points on a continuous dimension. Concrete structures (low integration index) characteristically possess,

> a greater tendency toward bifurcated (black-white, right-wrong, good-bad) thinking, absolutistic standards and an apparent dependence on these fixed standards as the only authority; a greater inability to generate conflict or ambiguity--an orientation in which the world is bent to fit the rule; a greater tendency to standardize judgements in a

> novel situation; a greater tendency not to interrelate perspectives; a poorer delineation between means and ends; a poorer capacity to act "as if" and to understand the other's perspectives; and less potential to perceive the self as a causal agent in interacting with the environment (Schroder, 1971, p. 257).

Schroder, Driver, and Streufert cite several techniques for assessing differentiation, discrimination, and integration. Integration is the most important behavioral referent from their perspective, and the Paragraph Completion test (PCT) is their preferred method of assessment. The test presents the subject with six stems representing structure, conflict, and uncertainty in the interpersonal area. The subject is required to write at least two sentences in response to each stem. Completions are scored by judges who are trained to focus on the structural properties of the responses.

Schroder et al. explicitly state how their theory differs from traditional approaches. The greatest departure, however, stems from their recognition of the ramifications of environmental factors on conceptual level. An interaction perspective is promoted. Level of conceptual structure and environmental complexity do not operate independently, according to Schroder, Driver, and Streufert. Both overly simple and overly complex environments

reduce the levels of integration involved. One fails to provide sufficiently diverse units to stimulate integration; the other provides information which is so diverse that integration is seriously hampered. Thus a general inverted U curve relationship between level of information processing and environmental complexity is postulated. Research supportive of this prediction is presented (Schroder, Driver, and Streufert, 1967).

Most complexity research could also be classified into the larger category of impression formation. A small group of impression formation theorists not allied with any particular complexity theory have sought to relate complexity to accuracy of interpersonal prediction and resolution of inconsistent impressions. Results in this area have been inconsistent. The work of Walter Crockett (1965) and associates has, however, been especially relevant to the present investigation. Crockett (personal communication) has designed an instrument to assess complexity based on the conjecture that complex subjects can more adequately reconcile potentially conflicting themes than noncomplex subjects (Nidorf, 1961), and complex subjects tend to fomulate more inferences from a set of information than do less complex subjects (Campbell, 1960;

Levanthal, 1957). The instrument is described in detail in a later section.

The Generality of Complexity

Fundamental to the development of theory and research design is the determination of whether or not to include cognitive complexity as a general personality trait. Until very recently, virtually no complexity theorist would claim that his measure had any great degree of generality, but even at that there remained a range in the degree of generality thought to exist.

Zajonc (1960) argued that cognitive structures are extremely transitory, shifting in complexity and integration to meet varying situational needs and demands, as well as varying with content area. This represents probably the extreme "fluidity" position. Most researchers are content to say merely that complexity may vary across domains (Gardner and Schoen, 1962; Scott, 1969).

Harvey (1966) proposed that since conceptual development is theoretically linked to parental training techniques, subjects will vary across areas to the extent that parents varied in their training programs. Schroder

et al. (1967) supported a similar perspective. In addition, they stated that the level of information processing in a given area varies over time due to environmental factors.

Crockett (1965) cited both supportive and unsupportive evidence, and considered the generality issue an open question. He did imply rejection of generality on the supposition that "an individual's constructs relative to others with whom he interacts frequently and intensely will be more complex than his constructs relative to categories of people with whom he interacts less intensely."

One of the most extensive examinations of generality to date was by Vannoy (1965), who studied the interrelationships of a number of "standard" complexity tests as well as several related measures. His stated purpose was to determine generality in the interpersonal domain. Vannoy reasoned that "if a factor analytic appraisal of the scores yielded by these measures reveals a single factor which accounts for a large portion of the variance of scores, and if the content of this factor is appropriate, we may conclude evidence of a general personality trait." The results indicate a conglomeration of factors

which account for complexity. Vannoy suggests therefore that complexity does not possess any degree of generality.

Although many theorists are content to stay "middle of the road" on the generality issue, a few have found empirical evidence supporting generality. Bieri and Blacker (1956) compared a construct fluency measure on the REP with complexity of determinants of Rorschach perceptions. They reported positive correlations between these diverse types of complexity. These results purportedly indicate some degree of generality although a replication by Sechrest and Jackson (1961) demonstrated that they were not strikingly powerful. Allard and Carlson (1963) compared complexity scores from three different REP tests, one using known people, another using famous people, the third geometric shapes. Their results also lend support to the generality of complexity.

Crano and Bettinghaus (1970) argued for the generality of complexity across diverse attitude domains. They have developed a measuring instrument which contains a number of evaluative qualifiers (or categories of judgment). The instrument is presented to subjects whose task involves using these qualifiers in describing reactions to a group of attitude objects. The qualifiers are

organized into a battery of semantic differential scales. Experimental findings (Crano and Bettinghaus, 1970) showed that some subjects tended to use these qualifiers with consistently restricted response variabilities (low complex) while others employed the categories with consistently unrestricted response variabilities (high complex). The results also correlated significantly with dogmatism scores, and were taken as evidence for the generality of complexity across domains of content.

Hypotheses

The present research was based primarily on the principle of convergence of comparable measures. Tests of complexity (Tuckman's ITI, the Crockett measure, and the Crano instrument) were expected to be representative of the same underlying construct. It was expected that the Crano-Bettinghaus measure would correlate highly with Tuckman's ITI and the Crockett instrument. Although both the ITI and the Crockett test were specifically designed to assess integration, while the Crano-Bettinghaus test is based on a differentiation measure, this difference was not expected to interfere with anticipated results.

Subjects high in differentiation should be correspondingly high in integration.

All of the complexity measures were also expected to correlate highly with measures of creativity and social desirability. The postulated creativity relationship is based on the assumption that an individual who is high in complexity has more alternatives available to him, and should therefore be more likely to produce creative responses. In addition, the finding that complex individuals tend to exhibit independence of judgment and originality (Barron, 1953) provides a direct link between the terms. Tuckman (1966) and Harvey (1966) cite additional support for the predicted relationship.

Creativity as used in this study is based upon a measure of the extent to which an individual's thinking embraces novelty and leads to the production of unusual responses; and a measure of the extent to which an individual's social and educational background conforms to the "creative" norms of the Biographical Inventory.

Social desirability has been equated with a need for approval (Marlowe and Crowne, 1964). An individual who characteristically demonstrates a reliance on cultural

stereotypes and standardized judgments may be at least partially motivated by needs for social approval. These tendencies have been demonstrated by individuals low in complexity (Schroder, 1971). It was expected that low complex subjects would show a greater need to respond in a socially desirable manner than high complex subjects. The complexity and social desirability measures were expected to have a high negative relationship.

The relationship between complexity and social desirability may be considered somewhat tenous in that it is theoretically plausible, but on the empirical level results have been inconsistent. Schroder, Driver, and Streufert (1967) found that measures of abstractness were unrelated to social desirability. Their results seem to indicate that the tendency to respond in a socially desirable manner may be present at any level of complexity. Although they accept the principle and state that a relationship should exist, their results nevertheless do not prove supportive. Using the Marlowe-Crowne scale, Bieri (1965) reported results opposite to these. He found that individuals low in complexity responded in a more socially desirable manner than subjects who were high in complexity.

Problem

The test developed by Crano and Bettinghaus thus far suggests a precise, expedient method of assessing complexity. Its principle advantage over many other tests rests in the simplicity of its scoring procedure. It eliminates the tedious time-consuming training procedures associated with several other methods.

The present research represented an attempt to provide construct validation for the Crano-Bettinghaus test using the multitrait-multimethod technique (Campbell and Fiske, 1959). The criteria for validation were measures of complexity (Tuckman's ITI and the Crockett measure), measures of creativity (Unusual Uses and the Biographical Inventory), and measures of social desirability (the Marlowe-Crowne and Edwards scales).

METHOD

Subjects

One hundred and twenty-three undergraduate students (40 males and 83 females) enrolled in introductory psychology classes at Michigan State University were recruited as subjects. Recruitment was accomplished through the standard procedure of sign-up sheets in various university lecture rooms. Prospective subjects were requested to participate in a "Person Perception" experiment to be held at various times and locations for which they would receive credit in their psychology classes.

Procedure

Ten experimental sessions were conducted with ten to thirty subjects and one experimenter participating. Each subject was given a stapled booklet containing the Unusual Uses, Crockett, Biographical Inventory, Marlowe-Crowne, Tuckman, Edwards, and Crano-Bettinghaus tests.

The tests were arranged so that the timed instruments (Unusual Uses and Crockett tests) were presented first. This was done to permit subjects to complete most of the task at their own rate of speed since the booklet was extremely long.

After presenting the booklets the experimenter asked the subjects to print only their sex in the upper right-hand corner of the questionnaire. The experimenter then urged that during the task all instructions be read carefully. The importance of asking about any part of the tests that was not fully understood was emphasized.

The subjects were allowed several minutes to read the instructions for the Unusual Uses test. After reading the instructions subjects were given four minutes to complete each part of the two part Unusual Uses task. The experimenter then allowed several minutes for reading the instructions for the Crockett instrument. The subjects were permitted five minutes to complete the task.

Upon completion of the Crockett test the experimenter instructed the subjects to finish the rest of the booklet, again urging that she be consulted about anything

which was not understood. Subjects were asked to surrender their booklets when they were completed, at which time they would receive credit for their participation. The subjects were given the option of waiting until everyone at the session has completed their booklets to be debriefed as to the full nature of the study.

Instruments

The Crano-Bettinghaus measure (see Appendix) has been previously described as a battery of semantic differential scales. Each of the ten scales (six evaluative and four fillers) requests the subject's opinion about ten different attitude objects (abortion, the Black Panthers, etc.). Each protocol is scored on the basis of the variability of response to each concept. A consensus of ranks is then derived as a summary measure.

Interpersonal Topical Inventory (Tuckman, 1966)--The subject is asked to choose one alternative (from each of six pairs) which best represents his feeling or reaction to interpersonal topics (see Appendix). Each alternative is classified I to IV on the concreteness-abstractness dimension. A subject is placed into the

system in which he scores in the eighth, ninth, or tenth decile (Tuckman, personal communication). Subjects scoring equally high in more than one system cannot be classified. The instrument is intended to be an objective measure of integration, and the topics are closely related to PCT sentence stems.

The Crockett measure (see Appendix) presents subjects with several contradictory statements about a stimulus person purportedly made by an individual well acquainted with him. Subjects are asked to write a five minute statement of their impressions of the stimulus person. Crockett (personal communication) suggests an intricate set of scoring procedures. After extensive experience with these procedures, however, the investigator decided to employ only the procedure for determining five levels of organization. In the present study impressions were scored on one of five levels according to Crockett's suggested guidelines. The levels were arranged in order of increasing complexity (level one being representative of concreteness; level five being representative of abstractness). Interjudge agreement for assigning subjects to the different levels was .87. Twenty-five

randomly selected protocols were used in determining agreement for all subjective measures.

The Biographical Inventory (Schaefer, 1970) is a questionnaire requiring subjects' responses on such things as home life, education, and hobbies. The subject is asked to indicate the provided response which is most nearly accurate for him. The instrument, consisting of four subscales, utilizes the life history approach for identifying creative persons. The Family scale which tended to yield low correlations with the other scales (Schaefer, 1970) was not included in the present study. Scoring keys are provided with the Biographical Inventory. Males and females are scored using four different keys. In an effort to assess males and females in comparable areas, only the art keys were used in this study. Schaefer (1970) reports test-retest reliability coefficients ranging from .87 to .95.

Unusual Uses (see Appendix)--Subjects are asked to list unusual uses for common objects within a designated time period. The test is one of the most common methods for assessing creativity. In the present study subjects were given one point for each suggested use which was

deemed to have high statistical or practical infrequency. Interjudge reliability was .84.

The Marlowe-Crowne Social Desirability Scale (Marlowe and Crowne, 1964) consists of 33 statements concerning personal attitudes and traits. Half are culturally acceptable but probably untrue, the other half are true but undesirable. Subjects are required to respond (true or false) to each statement. Each respondent receives one point for each item marked in the socially desirable direction. Scores may vary between 0 (low social desirability) and 33 (high social desirability). Internal consistency for the instrument (Kuder-Richardson 20) is reported at .88 (Marlowe and Crowne, 1964).

Edwards Social Desirability Scale--Using various scaling methods, Edwards (1957) determined the degree of social desirability of 79 MMPI items. Thirty-nine of these items were selected and designated the Social Desirability Scale. The scale requires subjects' responses (true or false) to the 39 statements. This response mode was modified in the present investigation. Subjects were asked instead to write a few sentences expressing their feelings about each of the statements. This modification was

necessitated by the fact that the multitrait-multimethod technique requires the measurement of a trait by at least two methods. Responses were given two points if they were in the socially desirable direction, one point if they did not reflect social desirability or undesirability, and no points if they were socially undesirable. Interrater reliability on this subjective measure was .97.

Measurement Technique

Validity of the measures was evaluated through a multitrait-multimethod matrix (Cambell and Fiske, 1959). Multitrait-multimethod analysis is based on the principles of convergent and discriminant validation which are essentially subclasses of construct validity. Convergent validation (with which this research was primarily concerned) represents evaluation of the instrument by independent measures of the critical variable. Discriminant validation, on the other hand, requires comparison of the critical variable with a series of other variables with which it is not expected to relate. The technique involves a matrix of intercorrelations between at least two traits measured by at least two different methods.

The present study used the following matrix format:

Method I (forced choice response)

Trait A --Complexity: ITI
Trait A_1--Complexity: Crano-Bettinghaus
Trait B_1--Social desirability: Marlowe-Crowne
Trait C_1--Creativity: Biographical Inventory

Method II (open-ended response)

Trait A_2--Complexity: Crockett
Trait B_2--Social desirability: Edwards
Trait C_2--Creativity: Unusual Uses

Method I used two measures of the critical variable (Tuckman's ITI and the Crano-Bettinghaus measures). The "extra" measure (ITI) was expected to augment obtained results. It was included primarily because it represents one of the few attempts to assess integrative complexity using a forced choice response mode.

Ideally both related and distinct variables would have been included in the matrix, but the construct of complexity embraces such a vast range of behaviors that it is difficult, if not impossible, to find meaningful variables with which it does not relate theoretically. Though the requirement of discriminant validation was

not intended to be fulfilled, it was expected that examination of the relationships among related variables would provide a basis for validity.

RESULTS

Intercorrelations of the three variables (complexity, creativity, and social desirability) were organized into a multitrait-multimethod matrix for the entire sample (Table 1). Correlations were computed using Pearson's r. Due to incomplete data, N ranged from 103 to 123.

For ease of interpretation, Campbell and Fiske (1959) suggest labeling various regions of the matrix. Three groups of matrix entries will be identified and used consistently: 1) The underlined values represent measurements of the same trait by different methods. These intercorrelations, generally termed validity diagonals or validity coefficients, indicate convergence of independent measures of the same trait (except in the Crano-Tuckman case where the methods are not independent). These values are the single most important determinants of convergent validity. 2) The values enclosed by a solid line represent heterotrait-monomethod blocks.

TABLE 1

INTERCORRELATIONS OF MEASURES (ALL Ss)

		Forced choice				Open-ended		
		A	A_1	B_1	C_1	A_2	B_2	C_2
Forced choice								
Tuckman	A							
Crano	A_1	.129						
Marlowe-Crowne	B_1	.006	.110					
Biog. Inventory	C_1	.193**	.094	.114				
Open-ended								
Crockett	A_2	.182*	.080	.027	.028			
Edwards	B_2	.173*	.008	.278***	-.076	-.043		
Unusual Uses	C_2	.156	.120	.062	.284***	.145	-.069	

***p < .01
**p < .05
*p < .10

These blocks are composed of intercorrelations between measures of different traits using the same method.

3) The values enclosed by a broken line are heterotrait-heteromethod blocks consisting of intercorrelations between measures having neither trait nor method in common.

The Crano-Bettinghaus measure was expected to correlate highly with the Crockett and Tuckman instruments. Convergence of the measures at this minimal level did not occur. The validity coefficients for the Tuckman-Crano and Crano-Crockett intercorrelations were not significantly different from zero. Among the complexity validity diagonals only the Crockett-Tuckman intercorrelation was marginally significant (.182 $p < .10$).

In addition to required significance, each validity diagonal should have also been higher than the other values lying in its column and row. (It should have been higher than both heterotrait-heteromethod and heterotrait-nonomethod intercorrelations in which it was involved.) None of the complexity validity diagonals met this requirement.

It was hypothesized that all of the creativity measures would have high positive intercorrelations with

the complexity measures. The Tuckman-Biographical Inventory entry (.193 $p < .05$) was the only correlation out of six that was supportive of this hypothesis.

The predicted complexity-social desirability relationship was not confirmed by experimental findings. The Tuckman-Edwards entry was, however, marginally significant (.173 $p < .10$). It should be noted that the validity coefficients for creativity (.284 $p < .01$) and social desirability (.278 $p < .01$) were both significant.

In view of the preponderance of female subjects, two additional matrices were constructed on the basis of sex. Table 2 presents a matrix based on females only. The adjusted N ranged from 70 to 83. Table 3 presents a matrix based on male subjects only. The N ranged from 30 to 40.

Table 2 indicates significant validity coefficients for the Crockett-Tuckman (.359 $p < .01$) and Crano-Tuckman (.212 $p < .10$) intercorrelations. In addition both coefficients met the requirement that neither correlate higher with different traits using the same method. Three of the six complexity-social desirability intercorrelations were negative though insignificant. One value the Tuckman-Edwards was

TABLE 2

INTERCORRELATIONS OF MEASURES (FEMALE Ss)

		Forced choice				Open-ended		
		A	A_1	B_1	C_1	A_2	B_2	C_2
Forced choice								
Tuckman	A							
Crano	A_1	.212*						
Marlowe-Crowne	B_1	-.121	.102					
Biog. Inventory	C_1	.193*	.179*	.145				
Open-ended								
Crockett	A_2	.359***	.001	.040	.073			
Edwards	B_2	.200*	-.051	.268**	-.019	-.028		
Unusual Uses	C_2	.230**	.134	.136	.261**	.149	-.067	

***p < .01
**p < .05
*p < .10

marginally significant (.200 $p < .10$), but in a positive direction. The complexity-creativity intercorrelations were significant in three cases (Tuckman-Unusual Uses, Crano-Biographical Inventory, and Tuckman-Biographical Inventory).

The male subjects (Table 3) did not have significant validity diagonals for the critical variable. None of the complexity-creativity intercorrelations was significant, and only one complexity-social desirability entry was marginally significant (.291 $p < .10$).

The most outstanding difference between males and females occurred in the complexity diagonals. On measures where females had high intercorrelations, males tended to have low or negative values. Conversely, in the instance where males had a relatively high (though nonsignificant) intercorrelation, the females were extremely low. The significance of male-female differences on the three complexity intercorrelations was tested using Fisher's z transformation. The Tuckman-Crockett difference was significant ($z = 2.10$ $p < .05$). Females had a significantly higher intercorrelation in the Tuckman-Crockett cell than males.

TABLE 3

INTERCORRELATIONS OF MEASURES (MALE Ss)

		A	A_1	B_1	C_1	A_2	B_2	C_2
Forced choice								
Tuckman	A							
Crano	A_1	.030						
Marlowe-Crowne	B_1	.291*	.200					
Biog. Inventory	C_1	.163	-.090	-.201				
Open-ended								
Crockett	A_2	-.103	.247	.028	-.069			
Edwards	B_2	.185	.138	.479**	-.197	-.153		
Unusual Uses	C_2	.076	.077	-.058	.526***	.112	-.164	

***p < .001
**p < .01
*p < .10

Differences between complexity intercorrelations within sexes were tested for significance using the t statistic. For females the Crockett-Crano and Tuckman-Crockett intercorrelations were significantly different (.358 $p < .05$). None of the intercorrelations for males were significantly different.

Table 4 presents means and standard deviations of scores for male and female subjects. The scores had comparable distributions.

TABLE 4

MEANS AND STANDARD DEVIATIONS OF MEASURES
(MALE AND FEMALE Ss)

Measure	Mean-Female	Mean-Male	SD Female	SD Male
Crano	60.193	65.750	35.360	36.409
Tuckman	3.556	3.364	.729	.994
Crockett	2.926	3.081	1.022	.924
M-C	15.205	13.150	7.652	4.742
Edwards	50.878	54.333	12.434	8.112
Uses	6.108	7.103	3.295	3.865
BI	105.084	102.650	6.031	3.906

The presence of methods variance in all trait intercorrelations was determined by comparing the levels of correlation between parallel values of the same method and different methods. For example, A_1B_1 and A_1B_2 were compared. Since both B_1 and B_2 represent the same trait, their intercorrelations with A_1 should be of approximately the same magnitude. If A_1 shares a much higher intercorrelation with B_1 methods variance is assumed.

In the present study most of the estimates of methods variance were large relative to the intercorrelations upon which they were based. In fact, the estimates were larger than the intercorrelations in several cases. The accurate determination of methods variance requires that intercorrelations between measures be much higher than those obtained in this investigation.

DISCUSSION

The data fail to provide support for the validity of the Crano-Bettinghaus measure. It is reasonable to assume that both methodological and theoretical factors had substantial effects on this outcome. It is suspected, however, that theoretical problems associated with the concept of complexity were most seriously implicated.

At the most simplistic methodological level, sampling inadequacies may have affected obtained results. Females outnumbered males by almost two to one in the study. With such large differences it is probable that the male subject sample was not as representative of the population as females.

The length of the task may have also introduced a degree of error. By the end of the task which was extremely long and tedious, boredom and disinterest may have discouraged some subjects from responding accurately.

There were no available reliability estimates for any of the complexity measures prior to the study. Assuming that the three complexity instruments are measuring

the same thing, the intercorrelations can be considered reliability estimates. It is therefore reasonable to entertain the possibility of instrumental error or trait instability. Such errors would tend to reduce or attenuate correlations between traits.

In the event that reliabilities were low it was perhaps presumptuous to employ the multitrait-multimethod technique. The technique is stringent and assumes a level of sophistication in measurement that may not yet be attained with complexity measures. Indeed Campbell and Fiske (1959) warn that few psychological instruments can fulfill the requirements of the technique.

The reliability issue exposes what may be the most crucial problem in complexity research--the lack of comparability between measures. Although this problem has been consistently raised by theorists (Bieri, 1965; Vannoy, 1965; Schroder, 1971) little has been done to alleviate it.

The basic problem seems to be in defining relationships among the complexity components. Theorists tend to rely either on differentiation or integration and apparently the instruments reflect this reliance by forcing subjects to attend to one or the other. In the present

study both Crockett and Tuckman measures are based essentially on integration. The correlation between them is significant in the female sample. The Crano instrument, on the other hand, was designed to assess differentiation. It is only marginally related to the ITI and unrelated to the Crockett test in the female sample.

Apparently differentiation and integration may not be linearly related. Schroder, Driver, and Streufert (1967) recognized the distinction between these two constructs and stated that higher levels of integration do not necessarily imply higher levels of differentiation. They lead one to infer, however, that the cases to which they are referring are exceptions. Bieri (1971) also recognized the issue, but dismissed it on the grounds that integrative functioning is more complicated and refractory to analysis than differentiation.

In factorial studies both Gardiner (1968) and Vannoy (1965) presented evidence that measures of differentiation are unrelated to measures of integration. These findings are theoretically difficult to accept, and one is led to conclude that the measures employed must not have been accurate in their operationalizations of the constructs. Another plausible explanation is that some

relationship other than a linear one exists. Indeed Schroder (1971) posited that the relationship between differentiation and integration is curvilinear. In any event, the distinction appears so pervasive that the possibility of nonlinearity must be recognized.

Rejection of the implicit assumption that levels of integration necessarily co-vary with levels of differentiation receives some support from the female sample in the present study. This line of reasoning is apparently not applicable to the males in the sample if selection inadequacies were not significant. Sex distinctions appear to have been operative. Although none of the validity coefficients for males were significant, one did approach significance: the Crockett-Crano entry. It is interesting to note that on the content side, both measures require evaluation of other people, objects, or ideas. The Tuckman measure is more self-oriented. This may be in line with Crockett's (1965) assumption that the intensity of one's relationship with significant others may affect complexity. If females are more intense in all relationships relative to males their complexity levels would be expected to be higher and more stable than males.

Even though the correlational analysis used in this study makes statements of causality invalid, the speculation nevertheless remains interesting. It is important in suggesting that though complexity is purported to be a structural variable, content factors cannot be dismissed as easily as some theorists suggest (Schroder, Driver, and Streufert, 1967). It may also serve to indicate that generality across and/or within domains of content may still be an open question.

The possibility of rejecting the generality of complexity finds some additional support in a further analysis of the domains associated with the complexity tests employed in this study. Both Crockett and Tuckman measures involved the interpersonal domain. The Crano measure involved many issues outside of the interpersonal area. If generality across stimulus domains as reported by Crano and Bettinghaus (1970) only occurs outside of the interpersonal domain, low correlations among the complexity measures would be expected. The results indicate that this possibility should be considered.

Social desirability was expected to be negatively related to complexity. Although nearly all of the obtained intercorrelations were nonsignificant there appears to be

a slight tendency for complexity to be positively related to social desirability for males and negatively related for females. Bieri (1965) found a similar relationship for females and attributed his finding to a greater degree of conservatism and conformity among less complex female subjects.

The male trend is more difficult to describe. It might relate to the fact that many of the social desirability statements (e.g. "I cry easily" from the Edwards scale) may have caused some embarrassment among male subjects in revealing what appeared to be "weak" characteristics. The fact that the male mean was slightly higher than the female mean on the Edwards measure provides some support for this speculation.

Another consideration centers around the validity diagonals for social desirability. Although significant, the diagonals should have been much higher if indeed the Edwards and Marlowe-Crowne measures were comparable. Arguments focusing on the pathological nature of the Edwards instrument have been advanced (Marlowe and Crowne, 1964). In view of its derivation from the MMPI it is possible that the Edward measure may be describing a different kind of social desirability than the Marlowe-Crowne.

The concept of creativity is beset with problems similar to those faced by complexity theory. Tryk (1968) described the foremost problems as the isolation and quantification of meaningful criteria, and the absence of a sufficiently general theoretical framework. It is not surprising then that the average correlation between measures of creativity is .30 (Wallach and Kogan, 1965). In the present study the obtained creativity intercorrelations were .261 for females and .526 for males. It can be assumed then that the measures used in this study were acceptable indicators of creativity.

The slight positive relationship found between complexity and creativity for females and its absence for males may be explained in terms of sex roles. It is clear that the educated female is not completely adhering to her traditionally prescribed role. It might be necessary, therefore, for this female to learn to implement more adaptive cognitive schemes in order to deal with her inconsistent position. These adaptive or creative characteristics may generalize into many areas of cognitive functioning, making females in the college population more creative than their male counterparts. Several studies (Trembly, 1964; Klausmeier and Wiersma, 1964) have found

that females are more creative than males. Results opposite to these (Torrance, 1963) as well as results indicating no differences between sexes (Torrance, 1961) have also been reported.

Evidence on sex differences suggests that males and females should behave differently in situations involving cognitive processes, but research in this area is in need of more systematic analysis. The "sex role" argument remains tenable, however, and illustrates, as have several of the findings, the possible presence and confounding influence of sex variables in cognitive functioning.

Summary

The present research suggests the need for more crucial specification of the components of complexity. Until this theoretical snag is mended, the various measures will probably continue to appear unrelated. Bieri (1966) has suggested that a developmental point of departure could be fruitful. Tracing differentiation and integration from early childhood might present a clearer picture of their relationship.

In addition, the research suggests that content and sex variables may be just as valuable in determining these specifications as structural variables. Complexity then may not be based on structure alone. If content variables are important, generality arguments will have to be revised accordingly.

Relational statements between complexity and other personality variables will have to await further clarification of the differentiation-integration issue. The parameters of complexity should be defined before empirical relationships are integrated into the theory.

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APPENDIX

UNPUBLISHED MEASURES

CROCKETT MEASURE

CROCKETT MEASURE

We are interested in the ways that people perceive and respond to others. The following four descriptions were contributed by individuals who are well acquainted with "John." Please read each of these descriptions, and indicate to the experimenter when you have completed your reading. Please do not go on to the next page until told to do so.

Four acquaintances' description of John:

1. John is sympathetic. He has a knack for showing sympathy for his friends when they need it most. He always listens carefully whenever someone tells him about what's bothering him. He has a real interest in those who come to him with their problems and is very good at comforting them.

2. John is boastful. The way he talks about himself and the things he's done, you would think he was perfect. He's always telling his friends how great he is, and bragging about his accomplishments. It seems as though John never stops boasting.

3. John is helpful. Whenever someone needs help, John is there to lend a hand. He is known for always doing his share, and he often contributes in ways that others would not. You can rely on him to pitch in whenever something important comes up.

4. John is selfish. Frequently he puts his own wants and desires ahead of his friends'. He seldom goes out of his way for anyone and even when he does he usually does it grudgingly. Somehow John always manages to put himself first.

Suppose a good friend of yours wanted to find out as much as he could about John. Write down what you know, think, and feel about him. Please take no more than 5 minutes.

UNUSUAL USES

UNUSUAL USES

In this task you are to list as many unusual uses as you can think of for a common object.

Your answers do not have to be complete sentences. You may use short phrases.

Work as rapidly as you can. You will be given four minutes to work on each object.

List as many unusual uses as you can think of for a paperclip. Write each use on a separate line.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____
25. _____

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

List as many unusual uses as you can think of for a newspaper. Write each use on a separate line.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____
25. _____

STOP HERE. WAIT FOR FURTHER INSTRUCTIONS.

CRANO-BETTINGHAUS MEASURE

CRANO-BETTINGHAUS MEASURE

OBJECT JUDGMENT TASK

The purpose of this section of the study is to measure the meanings of certain things to various people by having them judge them against a series of descriptive scales. In taking this test, please make your judgments on the basis of what these things mean to you. On several pages of this test booklet you will find concepts to be judged, and beneath each a set of scales. You are to rate the concept on each of these scales in order.

If you feel that the concept is very closely related to one end of the scale you should place your X-mark as follows:

President Nixon (is)

Fair :X :__:__:__:__:__:__: Unfair

or

Fair :__:__:__:__:__:__:X: Unfair

If you feel that the concept is quite closely related to one end of the scale (but not extremely related), you should place your mark as follows:

George Romney (is)

Strong :__:X :__:__:__:__:__: Weak

or

Strong :__:__:__:__:__:X:__: Weak

If the concept seems only slightly related to one side as opposed to the other side (but is not really neutral), then you should mark as follows:

N.A.A.C.P. (is)

Active :__:__:X :__:__:__:__: Passive

or

Active :__:__:__:__:X:__:__: Passive

If you consider the concept to be neutral on the scale, both sides of the scale equally associated with the concept, or if the scale is completely irrelevant, unrelated to the concept, then you should place your mark in the middle space, as shown below:

The American Flag (is)

Safe :__:__:__:X:__:__:__: Dangerous

IMPORTANT: (1) Place your X-marks in the middle of spaces, not on the boundaries:

This Not This

:__:X:__:__:__:__:X

(2) Be sure you check every scale for every concept--do not omit any.

(3) Never put more than one X-mark on a single scale.

Make each scale item a separate and independent judgment. Once you have made a judgment, move on to the next one, do not look back, or consider past judgments. Work at fairly high speed through this test. Do not worry or puzzle over individual items. There are no "right" or "wrong" answers. It is your first impression, your immediate "feelings" about the concept and scale that we want. On the other hand, please do not be careless, because we want your true impressions.

LEGALIZED ABORTION

Simple	:____:____:____:____:____:____:____:	Complex
Honest	:____:____:____:____:____:____:____:	Dishonest
Clean	:____:____:____:____:____:____:____:	Dirty
Pleasant	:____:____:____:____:____:____:____:	Unpleasant
Active	:____:____:____:____:____:____:____:	Passive
Fragrant	:____:____:____:____:____:____:____:	Foul
Kind	:____:____:____:____:____:____:____:	Cruel
Fast	:____:____:____:____:____:____:____:	Slow
Soft	:____:____:____:____:____:____:____:	Loud
Loose	:____:____:____:____:____:____:____:	Tight

LEGALIZATION OF MARIJUANA

Simple	:____:____:____:____:____:____:____:	Complex
Honest	:____:____:____:____:____:____:____:	Dishonest
Clean	:____:____:____:____:____:____:____:	Dirty
Pleasant	:____:____:____:____:____:____:____:	Unpleasant
Active	:____:____:____:____:____:____:____:	Passive
Fragrant	:____:____:____:____:____:____:____:	Foul
Kind	:____:____:____:____:____:____:____:	Cruel
Fast	:____:____:____:____:____:____:____:	Slow
Soft	:____:____:____:____:____:____:____:	Loud
Loose	:____:____:____:____:____:____:____:	Tight

SPIRO AGNEW

Simple	:____:____:____:____:____:____:____:	Complex
Honest	:____:____:____:____:____:____:____:	Dishonest
Clean	:____:____:____:____:____:____:____:	Dirty
Pleasant	:____:____:____:____:____:____:____:	Unpleasant
Active	:____:____:____:____:____:____:____:	Passive
Fragrant	:____:____:____:____:____:____:____:	Foul
Kind	:____:____:____:____:____:____:____:	Cruel
Fast	:____:____:____:____:____:____:____:	Slow
Soft	:____:____:____:____:____:____:____:	Loud
Loose	:____:____:____:____:____:____:____:	Tight

GUN CONTROL LAWS

Simple	:____:____:____:____:____:____:____:	Complex
Honest	:____:____:____:____:____:____:____:	Dishonest
Clean	:____:____:____:____:____:____:____:	Dirty
Pleasant	:____:____:____:____:____:____:____:	Unpleasant
Active	:____:____:____:____:____:____:____:	Passive
Fragrant	:____:____:____:____:____:____:____:	Foul
Kind	:____:____:____:____:____:____:____:	Cruel
Fast	:____:____:____:____:____:____:____:	Slow
Soft	:____:____:____:____:____:____:____:	Loud
Loose	:____:____:____:____:____:____:____:	Tight

SUPREME COURT

Simple	:____:____:____:____:____:____:____:	Complex
Honest	:____:____:____:____:____:____:____:	Dishonest
Clean	:____:____:____:____:____:____:____:	Dirty
Pleasant	:____:____:____:____:____:____:____:	Unpleasant
Active	:____:____:____:____:____:____:____:	Passive
Fragrant	:____:____:____:____:____:____:____:	Foul
Kind	:____:____:____:____:____:____:____:	Cruel
Fast	:____:____:____:____:____:____:____:	Slow
Soft	:____:____:____:____:____:____:____:	Loud
Loose	:____:____:____:____:____:____:____:	Tight

MEDICARE

Simple	:____:____:____:____:____:____:____:	Complex
Honest	:____:____:____:____:____:____:____:	Dishonest
Clean	:____:____:____:____:____:____:____:	Dirty
Pleasant	:____:____:____:____:____:____:____:	Unpleasant
Active	:____:____:____:____:____:____:____:	Passive
Fragrant	:____:____:____:____:____:____:____:	Foul
Kind	:____:____:____:____:____:____:____:	Cruel
Fast	:____:____:____:____:____:____:____:	Slow
Soft	:____:____:____:____:____:____:____:	Loud
Loose	:____:____:____:____:____:____:____:	Tight

THE BLACK PANTHERS

Simple	:____:____:____:____:____:____:____:	Complex
Honest	:____:____:____:____:____:____:____:	Dishonest
Clean	:____:____:____:____:____:____:____:	Dirty
Pleasant	:____:____:____:____:____:____:____:	Unpleasant
Active	:____:____:____:____:____:____:____:	Passive
Fragrant	:____:____:____:____:____:____:____:	Foul
Kind	:____:____:____:____:____:____:____:	Cruel
Fast	:____:____:____:____:____:____:____:	Slow
Soft	:____:____:____:____:____:____:____:	Loud
Loose	:____:____:____:____:____:____:____:	Tight

FRATERNITIES

Simple	:____:____:____:____:____:____:____:	Complex
Honest	:____:____:____:____:____:____:____:	Dishonest
Clean	:____:____:____:____:____:____:____:	Dirty
Pleasant	:____:____:____:____:____:____:____:	Unpleasant
Active	:____:____:____:____:____:____:____:	Passive
Fragrant	:____:____:____:____:____:____:____:	Foul
Kind	:____:____:____:____:____:____:____:	Cruel
Fast	:____:____:____:____:____:____:____:	Slow
Soft	:____:____:____:____:____:____:____:	Loud
Loose	:____:____:____:____:____:____:____:	Tight

DRAFT LOTTERY

Simple	:____:____:____:____:____:____:____:	Complex
Honest	:____:____:____:____:____:____:____:	Dishonest
Clean	:____:____:____:____:____:____:____:	Dirty
Pleasant	:____:____:____:____:____:____:____:	Unpleasant
Active	:____:____:____:____:____:____:____:	Passive
Fragrant	:____:____:____:____:____:____:____:	Foul
Kind	:____:____:____:____:____:____:____:	Cruel
Fast	:____:____:____:____:____:____:____:	Slow
Soft	:____:____:____:____:____:____:____:	Loud
Loose	:____:____:____:____:____:____:____:	Tight

INTERCOLLEGIATE ATHLETICS

Simple	:____:____:____:____:____:____:____:	Complex
Honest	:____:____:____:____:____:____:____:	Dishonest
Clean	:____:____:____:____:____:____:____:	Dirty
Pleasant	:____:____:____:____:____:____:____:	Unpleasant
Active	:____:____:____:____:____:____:____:	Passive
Fragrant	:____:____:____:____:____:____:____:	Foul
Kind	:____:____:____:____:____:____:____:	Cruel
Fast	:____:____:____:____:____:____:____:	Slow
Soft	:____:____:____:____:____:____:____:	Loud
Loose	:____:____:____:____:____:____:____:	Tight

INTERPERSONAL TOPICAL INVENTORY

INDIVIDUAL-TOPICAL INVENTORY
(Form A)

INSTRUCTIONS

You will be given some situations and topics to which we would like you to respond. The responses are given in pairs. You are to choose one response from each pair. Choose the response that most closely fits your opinion of feeling and indicate your choice by circling the letter "A" or "B" corresponding to the response chosen. Always choose one member of each pair. Never choose both members of the pair and do not skip over any of the pairs. If you agree with both, choose the one you agree with most strongly. If you do not agree with either, choose the one you find the least disagreeable of the two.

Example:

Here is an example of the way the questions will be asked and the way they should be answered. The manner in which you will indicate your choice between the two given responses is illustrated below:

When I am confused . . .

Pair No.	
(i)	
(A) I try to find a solution and end the confusion.	B I completely ignore the fact I am confused.
(ii)	
A I break out into a nervous sweat.	(B) I remain calm at all times.

How to respond:

First: Decide which response you agree with most.

Second: Indicate which response you agree with most by circling the identifying letter. Thus, if in comparing the first pair of statements, you agree with the statement, "I try to find a solution and end the confusion," more than with the statement, "I completely ignore the fact that I am confused," you would circle the letter "A" (above the chosen statement). Having chosen one (never both, never neither) statement from the first pair of statements, you would then move on to the second pair. If, in considering the second pair, you find that you agree more with the statement, "I remain clam at all times," (as compared to the statement, "I break out into a nervous sweat"), you would circle the letter "B."

On the pages that follow there are 36 different pairs of responses. There are six pairs to a side of a page and pairs appear on both sides of the pages. You are to select one response from each pair, the one that more accurately shows your opinion or feeling and record your choice by circling the letter indicating the statement chosen. Be frank and indicate, in each case, your true feeling or opinion or the reaction which you actually would make in the situation. Do not indicate how you should feel or act; rather, indicate how you do feel and act.

Make sure that you are aware of the situation or topic that each pair of responses refers to. You will find the situation or topic identified at the top of each page. All items on the page refer to the situation or topic appearing at the top of that page.

When you are finished, your paper should contain 36 circles. Check back and make sure that you have made 36 choices, no more no less.

Remember: (1) Respond only once for each pair; that is, choose one member of the pair, never both, never neither. Indicate your choice by circling either "A" or "B."

(2) Items appear on both sides of the page.

(3) When you are finished you should have made 36 circles.

Work at your own rate of speed but work straight through the inventory without stopping. Once you have completed a page do not return to it.

YOU MAY BEGIN

I. Imagine that someone has criticized you. Choose the response from each pair that comes closest to your feelings about such criticism. Indicate your choice by circling either "A" or "B."

When I am criticized . . .

Pair No.		
(1)		
	A	B
	I try to take the criticism, think about it, and value it for what it is worth. Unjustified criticism is as helpful as justified criticism in discovering what other people's standards are.	I try to accept the criticism but often find that it is not justified. People are too quick to criticize something because it doesn't fit their standards.
(2)		
	A	B
	I try to determine whether I was right or wrong. I examine my behavior to see if it was abnormal. Criticism usually indicates that I have acted badly and tends to make me aware of my own bad points.	It could possibly be that there is some misunderstanding about something I did or said. After we both explain our viewpoints, we can probably reach some sort of compromise.
(3)		
	A	B
	I listen to what the person says and try to accept it. At any rate, I will compare it to my own way of thinking and try to understand what it means.	I feel that either I'm not right, or the person who is criticizing me is not right. I have a talk with that person to see what's right or wrong.
(4)		
	A	B
	I usually do not take it with good humor. Although, at times, constructive criticism is very good, I don't always think that the criticizer knows what he is talking about.	At first I feel that it is unfair and that I know what I am doing, but later I realize that the person criticizing me was right and I am thankful for his advice. I realize that he is just trying to better my actions.

Pair No.	
(5)	
A	B
I try to ask myself what advantages this viewpoint has over mine. Sometimes both views have their advantages and it is better to combine them. Criticism usually helps me to learn better ways of dealing with others.	I am very thankful. Often I don't see my own errors because I am too engrossed in my work at the time. An outsider can judge and help me correct the errors. Criticism in everyday life usually hurts my feelings, but I know it is for my own good.
(6)	
A	B
It often has little or no effect on me. I don't mind constructive criticism too much, but I dislike destructive criticism. Destructive criticism should be ignored.	I try to accept and consider the criticism. Sometimes it has caused me to change myself; at other times I have felt that the criticism didn't really make much sense.

2. Imagine that you are in doubt. Choose the response from each pair that comes closest to your feelings about such doubt. Indicate your choice by circling "A" or "B."

When I am in doubt . . .

(7)	
A	B
I become uncomfortable. Doubt can cause confusion and make one do a poor job. When one is in doubt he should ask and be sure of himself.	I find myself wanting to remove the doubt, but this often takes time. I may ask for help or advice if I feel that my questions won't bother the other person.
(8)	
A	B
I don't get too upset about it. I don't like to ask someone else unless I have to. It's better to discover the correct answer on your own.	I usually go to someone who knows the correct answer to my question. Sometimes I go to a book which will set me straight by removing the doubt.

Pair No.	
(9)	
A	B
I first try to reason things out and check over the facts. Often I approach others to get ideas that will provide a solution.	I think things over, ask questions, and see what I can come up with. Often several answers are reasonable and it may be difficult to settle on one.
(10)	
A	B
I realize that I'll have to decide on the correct answer on my own. Others try to be helpful, but often do not give me the right advice. I like to judge for myself.	I usually try to find out what others think, especially my friends. They may not know the answer, but they often give me some good ideas.
(11)	
A	B
I look over the problem and try to see why there is a doubt. I try to figure things out. Sometimes I just have to wait awhile for an answer to come to me.	I try to get some definite information as soon as possible. Doubt can be bad if it lasts too long. It's better to be sure of yourself.
(12)	
A	B
I consider what is best in the given situation. Although one should not rush himself when in doubt, he should certainly try to discover the right answer.	I act according to the situation. Sometimes doubt can be more serious than at other times and many of our serious doubts must go unanswered.

3. Imagine that a friend has acted differently toward you. Choose the response from each pair that comes closest to your feelings about such an action. Indicate your choice by circling either "A" or "B."

When a friend acts differently toward me . . .

Pair No.		
(13)	A	B
	I am not terribly surprised because people can act in many different ways. We are different people and I can't expect to understand all his reasons for acting in different ways.	I am usually somewhat surprised but it doesn't bother me very much. I usually act the way I feel toward others. People worry too much about others' actions and reactions.
(14)	A	B
	I find out why. If I have done something wrong I will try to straighten out the situation. If I think he's wrong, I expect him to clear things up.	I feel that I may have caused him to act in a different way. Of course, he may have other reasons for acting differently which would come out in time.
(15)	A	B
	I first wonder what the trouble is. I try to look at it from his viewpoint and see if I might be doing something to make him act differently toward me.	It is probably because he has had a bad day, which would explain this different behavior; in other cases he may just be a changeable kind of person.
(16)	A	B
	It is probably just because something is bothering him. I might try to cheer him up or to help him out. If these things didn't work I would just wait for him to get over it.	I try to understand what his different actions mean. I can learn more about my friend if I try to figure out why he does things. Sometimes the reasons may not be very clear.

Pair No.	
(17)	
A	B
There has to be a definite reason. I try to find out this reason, and then act accordingly. If I'm right I'll let him know it. If he's wrong, he should apologize.	I usually let him go his way and I go mine. If a friend wants to act differently that's his business, but it's my business if I don't want to be around when he's that way.
(18)	
A	B
I don't get excited. People change and this may cause differences. It is important to have friends, but you can't expect them to always be the same.	I like to get things back to normal as soon as possible. It isn't right for friends to have differences between them. Whoever is at falut should straighten himself out.

4. Think about the topic of people in general. Choose the response from each pair that comes closest to your thoughts about people. Indicate your choice by circling "A" or "B."

This I believe about people . . .

(19)	
A	B
Whatever differences may exist between persons, they can usually get along if they really want to. Although their ideas may not agree, they probably still have something in common.	People can learn from those who have different ideas. Other people usually have some information or have had some experience which is interesting and can add to one's knowledge.
(20)	
A	B
People can act in all sorts of ways. No single way is always best, although at certain times a particular action might be wiser than others.	Each person should be able to decide the correct thing for himself. There are always a few choices to be made and the individual himself is in the best position to pick the right one.

Pair No.	
(21)	
A	B
Some people think they know what's best for others and try to give advice. These people shouldn't make suggestions unless asked for help.	There are certain definite ways in which people should act. Some don't know what the standards are and therefore need to be straightened out.
(22)	
A	B
I can tell if I am going to get along with a person very soon after meeting him. Most people act either one way or another and usually it is not difficult to say what they are like.	It's hard for me to say what a person is like until I've known him a long time. People are not easy to understand and often act in unpredictable ways.
(23)	
A	B
People have an outside appearance that usually isn't anything like what can be found on the inside, if you search long and hard enough.	Each person is an individual. Although some people have more good or bad points than others, no one has the right to change them.
(24)	
A	B
People can be put into categories on the basis of what they're really like. Knowing the way a person really is helps you to get along with him better.	People are unlike one another in many respects. You can get along with people better and better understand them if you are aware of the differences.

5. Think about the general topic of leaders. Choose the response from each pair that comes closest to your thoughts about leaders. Indicate your choice by circling either "A" or "B."

Leaders . . .

Pair No.		
(25)		
	A	B
	Leaders do not always make the right decisions. In such cases, it is wise for a man to look out for his own welfare.	Leaders are necessary in all cases. If a leader cannot make the right decisions another should be found who can.
(26)		
	A	B
	Leaders cannot provide all the answers. They are like other people--they have to try to figure out what action is necessary and learn from their mistakes.	Leaders make decisions sometimes without being sure of themselves. We should try to understand this and think of ways to help them out.
(27)		
	A	B
	I like a leader who is aware of how the group feels about things. Such a leader should not lead any two groups in exactly the same way.	A person should be able to put his confidence in a leader and feel that the leader can make the right decision in a difficult situation.
(28)		
	A	B
	There are times when a leader shouldn't make decision for those under him. The leader has the power to decide things, but each man has certain rights also.	A leader should give those under him some opportunity to make decisions, when possible. At times, the leader is not the best judge of a situation and should be willing to accept what others have to say.

Pair No.	
(29)	
A	B
Some leaders are good, others are quite poor. Good leaders are those who know what is right for the men under them. These leaders deserve the respect of every man.	Leaders cannot be judged easily. Many things go to make up good leadership. Most people fall short in some way or another, but that is to be expected.
(30)	
A	B
Leaders are needed more at certain times than at others. Even though people can work out many of their own problems, a leader can sometimes give valuable advice.	Some people need leaders to make their decisions. I prefer to be an individual and decide for myself, when possible. Most leaders won't let you do this.

6. Imagine that someone has found fault with you. Choose the response from each pair that comes closest to your feelings about such a situation. Indicate your choice by circling either "A" or "B."

When other people find fault with me . . .

(31)	
A	B
It means that someone dislikes something I'm doing. People who find fault with others are not always correct. Each person has his own ideas about what's right.	It means that someone has noticed something and feels he must speak out. It may be that we don't agree about a certain thing. Although we both have our own ideas we can talk about it.
(32)	
A	B
I first wonder if they are serious and why they have found fault with me. I then try to consider what they've said and make changes if it will help.	If enough people point out the same fault, there must be something to it. I try to rid myself of the fault, especially if the criticizers are people "in-the-know."

Pair No.	
(33)	
A	B
They have noticed something about me of which I am not aware. Although criticism may be hard to take, it is often helpful.	They are telling me something they feel is correct. Often they may have a good point which can help me in my own thinking. At least it's worthwhile to consider it.
(34)	
A	B
I may accept what is said or I may not. It depends upon who is pointing out the fault. Sometimes it's best to just stay out of sight.	I accept what is said if it is worthwhile, but sometimes I don't feel like changing anything. I usually question the person.
(35)	
A	B
I like to find out what it means; since people are different from one another, it could mean almost anything. A few people just like to find fault with others but there's usually something to be learned.	There is something to be changed. Either I am doing something wrong or else they don't like what I'm doing. Whoever is at fault should be informed so that the situation can be set straight.
(36)	
A	B
I don't mind if their remarks are meant to be helpful, but there are too many people who find fault just to give you a hard time.	It often means that they're trying to be disagreeable. People get this way when they've had a bad day. I try to examine their remarks in terms of what's behind them.

CHECK AND MAKE SURE THAT YOU'VE CHOSEN ONE MEMBER OF EACH PAIR.
(A TOTAL OF 36 CIRCLES)