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**CRAGO, Marjorie Ann, 1938-
THE RELATIONSHIP BETWEEN THEORETICAL
ORIENTATION AND COMPLEXITY-SIMPLICITY
AMONG PSYCHOLOGISTS.**

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**THE RELATIONSHIP BETWEEN THEORETICAL ORIENTATION AND
COMPLEXITY-SIMPLICITY AMONG PSYCHOLOGISTS**

by

Marjorie Ann Crago

**A Dissertation Submitted to the Faculty of the
DEPARTMENT OF PSYCHOLOGY
In Partial Fulfillment of the Requirements
For the Degree of
DOCTOR OF PHILOSOPHY
In the Graduate College
THE UNIVERSITY OF ARIZONA**

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STATEMENT BY AUTHOR

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SIGNED: Marjorie A. Cragg

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ABSTRACT

The study was designed to investigate the relationship between two variables -- cognitive complexity-simplicity and theoretical orientation in psychology. The Theoretical Orientation Survey developed by Richard W. Coan of The University of Arizona and four measures of complexity-simplicity (Barron-Welsh Art Scale, REP Test, Berkowitz Complexity Preference Scale, Budner Intolerance of Ambiguity Scale) were administered to fifty psychologists, most of whom were faculty members or graduate students at The University of Arizona

It was hypothesized that theoretical orientation in psychology would be significantly related to cognitive complexity-simplicity. It was expected that there would be significant differences in the theoretical orientation and complexity-simplicity of individuals specializing in different areas of psychology. Clinical psychologists, as a group, were expected to exhibit a more subjectivistic theoretical orientation and were expected to obtain higher cognitive complexity scores than experimental and physiological psychologists. Sex differences in theoretical orientation and complexity-simplicity were predicted. The intercorrelations between the four complexity-simplicity measures were expected to be low, replicating the findings of other researchers.

All of the hypotheses upon which the study was based received some support from the data. Theoretical orientation was significantly related to complexity scores on the REP Test but was not significantly related to scores on the other complexity-simplicity measures. High complexity scores on the REP Test were associated with a subjectivistic theoretical orientation in psychology including such factors as an emphasis on personal will rather than impersonal causality, holism, experiential content, a qualitative rather than quantitative orientation, and little emphasis on physicalism. Thus, cognitive complexity in the realm of interpersonal perception, as measured by the REP Test, was associated with a "tender-minded," subjectivistic theoretical orientation in psychology.

Area of specialization in psychology was significantly related to theoretical orientation. As was expected, experimental and physiological psychologists obtained higher scores on objectivism and related factors than did clinical psychologists. Clinical psychologists obtained significantly higher scores on the Berkowitz Complexity Preference Scale but there were no significant differences between the specialization groups on the other complexity-simplicity measures.

There were fewer differences between male and female psychologists than had been expected. The sexes differed significantly on only one of the theoretical orientation

factors, with females tending to be more theoretically oriented and males more factually oriented. There was no evidence of sex differences in complexity-simplicity. It was hypothesized that because of the homogeneity of the sample with regard to such factors as profession, educational level, and level of intelligence, fewer sex differences were found than might be found in the general population.

The intercorrelations between the four complexity-simplicity measures were low as had been predicted. There were low but significant correlations between scores on the Barron-Welsh Art Scale, Complexity Preference Scale, and the Intolerance of Ambiguity Scale. However, the REP Test was not significantly correlated with the other three measures which suggests that complexity in interpersonal perception is not necessarily associated with a preference for complex stimuli or a tolerance of ambiguity.

INTRODUCTION

This study deals with the relationship between two variables--complexity-simplicity and theoretical orientation among psychologists. The research literature pertaining to each of these variables will be considered separately, followed by a discussion of the hypotheses upon which the present study was based.

Complexity-Simplicity

Complexity-simplicity is one of several cognitive style variables which have received increasing attention over the past several decades. This increasing interest in cognitive style reflects a general trend in the study of personality to specify personality factors in terms of ways of perceiving and cognizing rather than considering personality as separate from cognitive processes. Cognitive style has been defined as "stable individual preferences in mode of perceptual organization and conceptual categorization of the external environment (Holtzman, 1965, p. 140)." Cognitive style has also been defined as an "amalgam of strategies" which an individual typically adopts in his approach to a wide variety of situations (Shouksmith, 1970, p. 149). Thus, the emphasis is on relatively enduring and consistent ways

of dealing with situations and processing information about the environment.

Complexity-simplicity is a cognitive style variable which has been studied in relation to such factors as personality characteristics, intelligence, creativity, interests and attitudes, psychopathology, developmental processes, and physiological correlates. Measurements of cognitive complexity are usually based on the number of categories which an individual typically employs in interpreting environmental stimuli and the range of stimuli which are included within a given category. In general, a person scoring high on cognitive complexity tends to use a larger number of categories in processing stimulus information and makes finer discriminations among stimuli than does the person scoring low on complexity.

Preference for Complex Stimuli

A frequently used measure in assessing complexity-simplicity is preference for complex stimuli. One measure of preference for complex stimuli is the Barron-Welsh Art Scale (Barron and Welsh, 1952). This scale consists of 86 drawings which the subject responds to by indicating whether he likes or dislikes each drawing. Scoring is based on preference for complex versus simple drawings; the assumption is that complex persons prefer complex stimuli. The Barron-Welsh Art Scale has been used in assessing complexity and

creativity among artists (Rosen, 1955), writers (Welsh, 1959), and architects and research scientists (MacKinnon, 1961).

Barron (1953, 1963a, 1968) has found that preference for complex drawings on the Barron-Welsh Art Scale is associated with artistic interests, independence, and unconventionality. Those who prefer complex drawings tend to describe themselves as more unstable, pessimistic, temperamental, and dissatisfied than do persons preferring simple drawings. They are also rated higher on effeminacy, verbal fluency, and impulsiveness and tend to have higher scores on the MMPI scales for schizophrenia, psychopathic deviance, and anxiety than do persons preferring simple drawings.

Persons preferring simple drawings on the Barron-Welsh Art Scale tend to describe themselves as stable, responsible, contented, and conservative. They are rated as more rigid and constricted and tend to have higher scores on the MMPI hysteria scale than do persons preferring complex drawings. On the whole, Barron's research indicates that cognitive simplicity (preference for simple drawings) is associated with greater personal stability and satisfaction than is cognitive complexity (preference for complex drawings) but simplicity is also associated with conservatism, rigidity, and repression. It should be noted that Barron's findings are based on intensive study of a number of people who lived at the Institute for Personality Assessment and

Research for a period of several days while they were being interviewed, tested, and observed in various situations.

Barron's (1968) work in the area of cognitive complexity is closely related to his studies of creativity. He has found that cognitive complexity is often one of the characteristics of a creative person. The relationship between complexity and creativity appears to be unidirectional, however, not all complex persons are creative but most creative persons tend to score high on complexity. Barron has found that complexity and creativity are not highly correlated with scores on standard intelligence tests, particularly when intelligence test scores are above 120. Kuusinen (1970) has found evidence to indicate that the relationship between cognitive complexity and creativity is curvilinear; that is, creativity increases as complexity increases up to a certain point and then increasing complexity is associated with decreasing creativity.

Several questionnaires have been developed to measure preference for complex stimuli. Barron (1953, 1963b) devised a complexity scale which successfully discriminated between high scorers and low scorers on the Barron-Welsh Art Scale. In research with the Barron Complexity Scale, it was found that underachievers obtained higher complexity scores than overachievers (Conklin, Boersma, and Zingle, 1967), complexity scores were correlated with several measures of sensitivity to the behavior of others (Altmann and

Conklin, 1972) but were unrelated to performance on a learning task involving complex designs (Messick and Fritsky, 1963).

Berkowitz (1957) developed a Complexity Preference Scale consisting of 18 items, most of which were taken from Barron's Complexity Scale. Berkowitz found that persons who scored high on this scale, indicating a preference for complex stimuli, were less ethnocentric and had lower leveling scores on a memory task than did those scoring low on complexity.

Another questionnaire measure of complexity is the complexity scale of the Omnibus Personality Inventory (Heist and Yonge, 1968). According to Heist and Yonge, this scale is correlated with preference for complex designs, tolerance of ambiguity, and flexibility.

It is interesting to note that before systematic efforts were made to measure complexity-simplicity, Eysenck (1941a, 1941b) had discovered a factor, which he called the K-factor, corresponding to the complexity-simplicity dimension. This factor was evident throughout various stimulus classes such as odors, colors, paintings, and poems. One end of this bipolar factor was characterized by a preference for strong odors, poems with obvious rhyming schemes, and simple paintings. The other end was represented by a preference for subtle odors, complex paintings, and poems with looser and more variable rhyming schemes. In confirmation

of some of Eysenck's findings, Wilson, Ausman, and Mathews (1973) noted that preference for abstract and complex paintings was associated with liberalism and preference for simple, representational paintings was associated with conservatism.

Some of the findings in comparative and developmental psychology regarding preference for complexity should be mentioned at this point to provide a broader understanding of complexity preference. In animal research, it has been found that rats will choose to follow complex rather than simple pathways (Dember, Earl, and Paradise, 1957) and will spend more time inspecting complex stimuli (Sales, 1968). Karmel (1966, 1969a, 1969b) noted that looking time in rats, chicks, and human infants was more related to the contour of the stimulus than to complexity, but there is some question as to whether contour is to be considered as separate from complexity or as an aspect of complexity.

There is evidence that infants and young children prefer complex rather than simple stimuli (Cantor and Cantor, 1964; Cantor, Cantor, and Ditrichs, 1963; May, 1963; Munsinger and Kessen, 1966b; Smock and Holt, 1962). The contradictory results obtained in other studies of complexity preference in children (Haith, Kessen, and Collins, 1969; Hershenson, 1964; Hershenson, Munsinger, and Kessen, 1965) may be due, in part, to differences in the complexity of the stimuli used by different investigators and differences in

the ages of the children in each sample since complexity preference seems to change with age.

Preference for complex stimuli in infants and young children apparently increases with age (Brennan, Ames, and Moore, 1966; Munsinger, Kessen, and Kessen, 1964; Thomas, 1965) until early adolescence (Munsinger, 1966) or mid-adolescence (Thomas, 1966) when there is a reversal of this trend. By the time adulthood is reached, the individual tends to prefer stimuli of intermediate complexity (Bryson and Driver, 1972; Dorfman and McKenna, 1966; Munsinger and Kessen, 1966a; Rump, 1968; Vitz, 1966). This finding applies to the general population but not to specialized groups such as artists who tend to prefer complex stimuli (Munsinger and Kessen, 1964).

Generalizing from the animal research and developmental studies which have been mentioned, it appears that both animals and humans have a preference for complex stimuli. In humans, complex stimuli are preferred during infancy and childhood but sometime during adolescence this trend is reversed and by the time adulthood is reached, intermediate levels of complexity are preferred.

Preference for complex stimuli has been the focus of numerous investigations by Berlyne and his associates. Most of these studies have been aimed at testing some aspect of Berlyne's (1960) arousal theory in which it is postulated that complex stimuli contain more uncertainty and incongruity

than simple stimuli and are, therefore, more arousing. Support for this theory has been obtained in studies relating preference for complex stimuli to exploratory behavior, verbal ratings, and physiological correlates. The stimuli used by Berlyne and his associates to measure complexity have usually been visual (line drawings or random shapes), although occasionally auditory stimuli have been used.

A number of studies of exploratory behavior have shown that individuals, when given a choice, prefer to look at complex rather than simple stimuli for longer periods of time (Berlyne, 1958a, 1958b; Berlyne and Crozier, 1971; Day, 1966, 1968b; Dent and Simmel, 1968; Leckart, 1966; Leckart and Bakan, 1965; Minton, 1963; Wohlwill, 1968). However, in a later study, Berlyne (1972b) found no significant relationship between exploratory behavior and stimulus complexity. This may have been due, as he pointed out, to using less complex stimuli than had been used in other studies:

Contradictory results were also obtained in an earlier study of exploratory behavior by Berlyne (1963) in which it was found that subjects chose to look at either many or few complex stimuli. Heckhausen (1964) suggested that Berlyne's findings were due to differences between subjective and objective definitions of complexity. Some of the stimuli Berlyne had labeled as simple were, according to Heckhausen, subjectively complex. Heckhausen maintained that behavior is not a function of objective complexity but

of subjective complexity, i.e., the complexity of the stimulus as it is perceived by the individual. In a reply to Heckhausen, Berlyne (1964) stressed that the stimulus is an objective, physical event which is responded to as such by the central nervous system regardless of the verbal label which the subject may attach to the event.

The relationship between subjective and objective measures of complexity has been the focus of various studies. In some studies, a close association between subjective and objective measures was found (Day, 1965; Grove and Eisenman, 1970) but in other studies there was little agreement between the two measures (Berlyne et al., 1967), agreement only in the middle ranges of objective complexity (Nicki, 1972), agreement between some measures and not others (Snodgrass, 1971). Obviously, this is an area requiring further investigation.

In studies of subjective complexity based on verbal ratings, Berlyne (1963) and Berlyne and Peckham (1966) found that complex stimuli were rated as more interesting and simple stimuli as more pleasing. Similar results were obtained in other studies (Day, 1967a, 1967b, 1968a; Eisenman, 1966c; Evans and Day, 1971). Berlyne (1970) found that repetition of the stimulus had different effects on pleasingness and interestingness ratings. Simple stimuli were rated as more pleasing initially but as they were repeated they became less pleasing, whereas the opposite was true of

complex stimuli. As Day (1967a) points out, these differences between ratings of interestingness and pleasingness suggest that an individual who is asked to respond in terms of his preferences for certain stimuli may respond differently depending on whether he interprets preference to mean how interesting the stimulus is to him or how pleasing it is to him. These differences between interestingness and pleasingness ratings may help to explain some of the contradictory results which have been obtained with preference measures of complexity.

A number of studies have indicated that preference for complex stimuli is associated with higher levels of arousal as measured by the EEG (Baker and Franken, 1967; Berlyne and McDonnell, 1965; Gale, Christie, and Penfold, 1971; Gale, Coles and Boyd, 1971; Gale, Dunkin, and Coles, 1969). Nicki (1972) found EEG arousal to be highest in the middle ranges of complexity. In a study by Christie et al. (1972), complexity as measured by the number of elements contained in each visual pattern was associated with an increase in EEG arousal but complexity as measured by the variety of elements in the pattern had no consistent effect on the EEG measure. Thus, the relationship between stimulus complexity and other variables is dependent to a great extent on how complexity is defined and measured.

Studies of stimulus complexity and arousal as measured by the galvanic skin response (GSR) have yielded

contradictory results. Berlyne et al. (1963) found a positive relationship between the GSR and stimulus complexity but this finding was not confirmed in a later study (Berlyne and Lawrence, 1964).

There have been various attempts to relate anxiety, as an arousal state, to preference for complex stimuli. Barron (1953) found that anxiety was associated with preference for complexity but opposite results were obtained by Berlyne and Lewis (1963). Evidence that anxious persons tend to prefer less complex stimuli was also obtained in studies of school children (McReynolds, Acker, and Pietila, 1961) and hospitalized schizophrenics (McReynolds, 1960, 1963; McReynolds and Bryan, 1956; Sidle, Acker, and McReynolds, 1963).

Among college students, both positive and negative relationships between anxiety and complexity preference have been found (Haywood, 1961, 1962; O'Leary, 1965). In a study by Eisenman (1968d), preference for complexity in college students was associated with moderate levels of manifest anxiety. Individuals who exhibited either high or low levels of anxiety tended to prefer simple rather than complex stimuli. As Haywood (1961) has suggested, the level at which anxiety or arousal becomes disruptive rather than facilitative may be lower for schizophrenics than for college students. At any rate, it is apparent that the relationship

between anxiety and complexity preference needs to be further clarified.

Only a few studies of auditory stimulus complexity have been reported. In one study, neither subjective nor objective measures of auditory stimulus complexity were related to EEG arousal (Berlyne et al., 1967). In another study, simple rather than complex stimuli were associated with higher levels of EEG arousal (Gale et al., 1972). In analyzing the subjects' verbal ratings of the stimuli, it was found that the simpler tones were rated as more monotonous and irritating which would tend to make them more arousing.

No sex differences in preference for complex stimuli have been found in studies based on Berlyne's arousal theory (Berlyne and Boudewijns, 1971; Berlyne and Crozier, 1971; Dent and Simmel, 1968; Leckart, 1966). In crosscultural studies of stimulus complexity, it has been found that complex art is preferred in societies with complex social structures (Berlyne, 1971) and that the complexity of a stimulus tends to be rated similarly in different cultures (Berlyne, 1972a).

It is apparent from the studies which have been mentioned that Berlyne's arousal theory as applied to preference for complexity has stimulated a great deal of research. Studies of exploratory behavior, EEG arousal, and verbal ratings have presented considerable evidence for Berlyne's

contention that preference for complexity is associated with higher levels of arousal.

Eisenman and his associates have utilized polygons differing in number of angles or sides as a measure of preference for complexity. Scoring consists of subtracting the number of angles on the least preferred polygons from the number of angles on the most preferred polygons. The most complex polygons are considered to be those with the largest number of angles.

Sex and birth order differences in polygon preference were reported in several studies. Females, as a group, were found to prefer more complex polygons than males; among males, the most complex polygons were preferred by the first born males whereas, among females, the most complex polygons were preferred by the later born females (Eisenman, 1967a, 1967c, 1968d; Eisenman and Robinson, 1968; Taylor and Eisenman, 1968). In a study by Looft and Baranowski (1971b) the findings regarding sex differences were confirmed but significant birth order differences were not found.

In other studies utilizing polygon preference as a measure of complexity, it was found that those scoring high on complexity, compared to low scorers, showed greater independence of judgment (Taylor and Eisenman, 1968), were more creative (Eisenman and Grove, 1972; Eisenman and Robinson, 1967; Eisenman and Schussel, 1970; Taylor and Eisenman, 1964), were better able to integrate incongruent

information (Eisenman and Platt, 1968), and had higher scores on an insolence scale (Eisenman, 1968a). Also, high scorers exhibited moderate levels of anxiety; higher or lower levels of anxiety were associated with a preference for simplicity rather than complexity (Eisenman, 1968d).

Bryson and Driver (1972) discovered an interesting relationship between complexity (as measured by an impression formation test), introversion-extroversion, and preference for complex polygons. They found that complex introverts preferred simple polygons while simple introverts preferred complex polygons. Moderate levels of polygon complexity were preferred by extroverts. These findings contradict the assumption that complex persons prefer complex stimuli. Bryson and Driver stressed differences between objective and subjective complexity in explaining their findings. According to Bryson and Driver, complex persons may elaborate the inputs they receive so that, in effect, the stimulus may be more complex for them than it is for the less complex person. It should be pointed out that their study was based on a relatively small sample (ten subjects in each of four contrasted groups) and needs to be replicated with a larger group.

Individuals who score low on the polygon measure of complexity preference have been found to be more influenced by persuasion techniques (Eisenman and Boss, 1970), exhibit the greatest amount of attitude change if highly involved with an issue but the least amount of change if not highly

involved (Eisenman, 1968c), and react more negatively to ego-threatening information (Eisenman, 1968b). Females who preferred less complex polygons were found to be more anxious than those preferring higher levels of complexity (Eisenman, 1965b). Schizophrenics expressed preferences for less complex polygons than college students (Eisenman, 1965a, 1966b).

It was demonstrated in several studies that polygon preference can be manipulated by experimental procedures such as approval or disapproval by the experimenter (Eisenman, 1966b; Eisenman, Hannon, and Bernard, 1966). Eisenman and Gellens (1968), however, found no significant change in polygon preferences under mild stress conditions.

Eisenman and Coffee (1964) found significant differences in the polygon preferences of art and mathematics students; art students preferred asymmetrical polygons and mathematics students preferred symmetrical polygons. Looft and Stock (1968), however, found no significant differences in the polygon preferences of students majoring in such fields as agriculture, engineering, and home economics. They attributed their lack of significant results to the fields being too broad and to the students not having made permanent vocational choices. No significant differences in polygon preference were found in relation to intelligence (Eisenman and Robinson, 1967) or scores on Rotter's scale of internal-external locus of control (Taylor and Eisenman,

1968). Low to moderate correlations between complexity preference and a change seeking index were reported (Looft and Baranowski, 1971a).

The results of several studies indicate that complexity-simplicity and symmetry-asymmetry should be considered as separate dimensions (Eisenman, 1967b, 1968e; Eisenman and Rappaport, 1967; Grove and Eisenman, 1970). In these studies, it was found that both simple and complex symmetrical polygons were rated favorably but complex asymmetrical polygons were rated unfavorably. The majority of subjects preferred polygons of low or intermediate complexity. Dorfman and McKenna (1966) and Looft (1971), however, have pointed out that the conclusion that most people prefer intermediate levels of complexity may be an artifact resulting from the pooling of data from many subjects, thereby obscuring individual differences in complexity preference.

Correlations between subjective and objective measures of polygon complexity were reported to be in the low .90's for both males and females (Grove and Eisenman, 1970). Complex polygons were rated as more interesting than simple polygons (Eisenman, 1966c), confirming some of Berlyne's findings. In some instances, complex polygons were rated as more meaningful (had higher association values) than simple polygons (Eisenman, 1966a).

In generalizing from the work of Eisenman and his associates, it appears that sex, and possibly birth order,

are factors affecting polygon preference. Individuals preferring complex polygons were found to be more capable of integrating incongruent information, were more creative, and less influenced by persuasion techniques. They exhibited moderate levels of anxiety and greater independence of judgment than those preferring simple polygons. In one study, there were indications that personality factors such as introversion-extroversion may affect complexity preference. No significant relationship between polygon preference and such factors as intelligence and internal-external locus of control were noted. In several of Eisenman's studies, there was evidence that complexity-simplicity and symmetry-asymmetry are separate dimensions although they are often confounded in measures of cognitive complexity.

There are several theoretical assumptions underlying complexity preference research which should be mentioned. One theory is that the organism seeks to maintain an optimal level of stimulation by approaching or choosing stimuli which are near this level and ignoring stimuli which are above or below this level. This type of theory has been proposed by Berlyne (1960) and Dember, Earl, and Paradise (1957), among others. According to this theory, an individual who prefers complex stimuli does so because his optimal level of stimulation is higher than that of a person who prefers simple stimuli. The research of Berlyne and his associates has provided evidence for this theory.

Munsinger and Kessen (1964) have suggested that an individual's preference for complex stimuli is directly related to his ability to process complex information. As evidence for this theory, Munsinger and Kessen (1966a) found that persons who preferred complex stimuli were better able to recall the stimuli later, indicating that they were better able to process the stimulus information.

Berlyne (1960), Bieri (1961), and Sechrest and Jackson (1961) have suggested that complexity preference is related to the amount of stimulation in the home during childhood. There is some evidence for this contention since, in animal research, it has been found that complexity preference, as manifested by looking time and other exploratory behaviors, is related to the complexity of the environment in which the animal was reared (Berlyne, 1971, p. 185).

The assumption that a preference for complex stimuli is indicative of a complex cognitive system has been challenged by Bryson and Driver (1972) and Bieri (1961), among others. Bieri has postulated that motivational factors may be of equal or greater importance than cognitive factors in determining preference for complex stimuli. Bieri has also contended that an individual may demonstrate complex cognitive functioning in one area or stimulus domain but not in others. Since the assumption of a direct relationship between complexity preference and cognitive complexity

provides the basis for most complexity preference research, this would seem to be an important area for further investigation.

Complexity in Interpersonal Perception

The most frequently used method of assessing cognitive complexity in the interpersonal realm is the Role Construct Repertory Test (REP Test) developed by George Kelly (1955). This test provides a means of sampling the important constructs or categories which an individual uses in giving structure to his interpersonal environment. On the REP Test, the subject is asked to indicate the similarities and differences between people occupying various roles in his life such as father, mother, friend, disliked person, and so on. Scoring is usually based on the number of different constructs used by the subject in these comparisons and the similarities and differences among constructs. The assumption is that the greater the number of constructs used and the greater the differentiation among constructs, the greater the complexity of the individual's cognitive system.

The REP Test was first used in studying cognitive complexity by Bieri (1955) who found that persons scoring high on complexity were more accurate in perceiving differences between themselves and others than in perceiving similarities. Persons scoring high on simplicity, on the other hand, were more inclined to emphasize similarities

between themselves and others, a tendency sometimes leading to unwarranted assumptions of similarity. Similar results were obtained in studies by Campbell (1961), Plotnick (1961), and Pryon (1965). In several other studies, the results were not significant but were in the expected direction (Leventhal, 1957; Sechrest and Jackson, 1961).

It was found that high complexity scorers tended to be more ambivalent in their impressions of other people and were less likely to describe others in terms of dichotomous categories (Campbell, 1961; Scott, 1963; J. Supnick, 1964, cited by Crockett, 1965). It was reported in several studies that complex persons were better able to integrate incongruent information of an interpersonal nature than were persons scoring low on complexity (Fertig and Mayo, 1970; Mayo and Crockett, 1964; Nidorf, 1962). This finding may require further substantiation since contradictory results were obtained by L. Supnick (1964) while Rosankrantz and Crockett (1965) found that the relationship held true only for males.

Contradictory findings were reported in studies of changes in impressions of another person following presentation of additional information about that person. Cognitive simplicity was associated with least change in initial impression in one study (Lundy and Berkowitz, 1957) and with greatest impression change in another study (Leventhal and Singer, 1964). Crockett (1965) has suggested that some of

the inconclusive results obtained in studies of impression formation may be due, in part, to differences in the source of the information. In some studies, the information is provided by friends of the person being judged and in other studies by the person himself. According to Crockett, if the person presents favorable information about himself with insufficient modesty, then judges may form negative impressions from positive information. This seemed to be the case in the study by Leventhal and Singer (1964) who found greater acceptance of the truth of negative self-reports than of positive self-reports.

Various relationships between cognitive complexity and extremity of judgments have been reported. Higgins (1959), cited by Bieri (1961), found complex persons to be less extreme in their judgments while Nidorf and Argabrite (1970) found that complex females, but not males, were more extreme in their semantic differential ratings of such concepts as self, other, and nature. In a study by Larsen (1971), no evidence of a relationship between cognitive complexity and extremity of judgments was obtained.

It was noted in several studies that persons scoring high on complexity tended to be less certain of their judgments than low scorers (Fertig and Mayo, 1970; Higgins, 1959; Leventhal and Singer, 1964). Although complex persons may attach less certainty to their judgments, Tripodi and Bieri (1964, 1966) found that they were more confident of judgments

based upon incongruent information than were persons scoring low on complexity.

In other research, it was reported that high complexity scores on the REP Test were associated with a preference for avant-garde art (Pryon, 1966b), high levels of personality integration (Murphy and Seeman, 1971), field independence in males but not in females (Bieri and Messerley, 1957), and choosing a vocation compatible with one's personality (Bodden, 1970; Bodden and Klein, 1972). In a study by Gottesman (1962), training as a client-centered therapist did not increase REP Test complexity scores but Harrison (1966) reported an increase in complexity scores following sensitivity training.

In other studies, Koenig and Seaman (1973) found no relationship between cognitive complexity and role playing ability. Ogilvie (1971) found no significant correlation between cognitive complexity and scores on a repression-sensitization index. Studies of the relationship between intelligence and cognitive complexity in the interpersonal realm have yielded very low or zero correlations, particularly when intelligence is above average (Crockett, 1965).

Cognitive simplicity has been associated with prejudice and stereotyped attitudes toward others (Koenig and King, 1962, 1964; Pryon, 1966a), a need for cognitive balance (Scott, 1963), and lack of flexibility (Scott, 1962). In a study by Jones (1961), male psychiatric patients obtained

higher simplicity scores on the REP Test than did control subjects.

The picture of the cognitively complex individual which emerges from studies of interpersonal perception is that of a person who tends to be quite accurate in perceiving others, particularly in perceiving differences between the self and others. The complex person is inclined to perceive both positive and negative qualities in other people rather than engaging in black-and-white thinking in which the other person is seen as either good or bad. There are indications that the complex person feels more confident in dealing with incongruent information about others and is, therefore, better able to integrate such information than is the person with a more simple cognitive system.

Integrative Complexity

The theory of integrative complexity proposed by Harvey, Hunt, and Schroder (1961) is concerned with the way in which information about the environment is processed and organized by the individual. Harvey, Hunt, and Schroder view information processing as a continuum; at one end information is processed in a relatively simple and concrete manner while at the other end information is processed by more complex and abstract methods. Persons with complex conceptual systems have a relatively large number of categories or dimensions available for evaluating information

about the environment (conceptual differentiation) and various rules or schemata for organizing and integrating this information (conceptual integration). Most cognitive complexity research has focused almost entirely on measures of conceptual differentiation. Harvey, Hunt, and Schroder are among the few researchers who have emphasized processes of conceptual integration.

Harvey, Hunt, and Schroder have also stressed the relationship between the complexity of the individual's cognitive system and the complexity of environmental stimuli. The greatest complexity in information processing is associated with moderate levels of environmental complexity (Schroder, Driver, and Streufert, 1967). Thus, it appears that the simple environment contains too little information to warrant complex processing and the complex environment contains too much. Environmental complexity is determined primarily by three factors: information load (the amount of information available), information diversity, and rate of change.

By means of various semiprojective measures such as the Sentence Completion Test, This I Believe Test, and Impression Formation Test, four conceptual systems ranging from the most concrete and simple to the most abstract and complex have been distinguished by Harvey, Hunt, and Schroder and their associates. They hypothesize that different forms of psychopathology are associated with different

conceptual systems. They view the most simple and concrete conceptual system as especially susceptible to schizophrenia, the moderately concrete system to psychopathic disorders, and the moderately abstract system to depressive states. The most abstract conceptual system is not associated with any particular form of psychopathology because it is a more open and flexible system which, therefore, limits the range of conditions which are threatening to the individual.

Most studies of integrative complexity have utilized some type of game situation as a behavioral measure of complexity in information processing. These games are usually military, political, or economic in nature and require the subject to search for information, develop strategies, and negotiate with other teams.

A number of studies utilizing the tactical games and semiprojective measures of complexity which have been mentioned have indicated that individuals with a more abstract or complex conceptual system process information more effectively than do persons whose conceptual system is relatively simple and concrete (Karlins et al., 1967; Karlins and Lamm, 1967; Schneider and Giambra, 1971; Streufert, 1970; Streufert and Driver, 1965; Suedfeld and Hagen, 1966; Tuckman, 1964).

Although concrete-simple persons often seek more information about a situation than do abstract-complex persons, they do not do so when large amounts of information

have to be integrated (Suedfeld and Streufert, 1966) or under other conditions which are not conducive to information seeking (Streufert and Castore, 1971). Abstract-complex persons tend to be more uncertain of their cognitive judgments than are concrete-simple persons (Sieber and Lanzetta, 1964). Concrete-simple persons tend to use fewer and more extreme categories in their judgments of an issue (White and Harvey, 1965). In groups composed of many abstract-complex members, there was more uncertainty in role distribution and more interpersonal conflict (Stager, 1967).

It should be noted that even though abstract-complex and concrete-simple persons differ in their methods of information processing, they usually do not differ in successful performance in the tactical games and problem-solving tasks which have been used as measures of information processing (Suedfeld and Hagen, 1966; Tuckman, 1964). Driver (1960) found that when success in a tactical game depended on the report of an authority, the concrete-simple groups performed more successfully but when success depended on the integration of a number of indices, the abstract-complex groups performed better.

In contrast to concrete-simple persons, those who are abstract-complex are superior in role-taking ability (Wolfe, 1963), are more creative (Tuckman, 1966a; Karlins, 1967), discriminate more between others on a modified REP

Test (Carr, 1965a, 1965b), have higher GSR arousal levels when viewing stimuli of varying complexity (Bryson and Driver, 1969, 1972), and experience greater subjective distress under sensory deprivation conditions (Suedfeld, 1964b). Abstract-complex persons tend to come from nonauthoritarian families in which they were allowed to be relatively independent as children (Cross, 1966). Also, they obtain more personal information from others than they reveal about themselves (Tuckman, 1966b), which fits in with Schroder, Driver, and Streufert's (1967) description of them as information seekers.

Abstract-complex and concrete-simple persons tend to use different types of conflict resolution processes, i.e., concrete-simple persons are more likely to use a single process or a set of consistent processes whereas abstract-complex persons are more inclined to use a variety of conflict resolution processes (Crano and Schroder, 1967; Janicki, 1964). They also perceive success and failure differently (Higbee and Streufert, 1968); concrete-simple persons take more credit for their successes and place more blame on external factors when they fail (Streufert and Streufert, 1969).

In one study, abstract-complex persons were found to be more conforming than concrete-simple persons (Janicki, 1962) but, in other studies, greater and longer lasting attitude change due to propaganda, sensory deprivation, or

other conditions was found among concrete-simple persons (Harvey, 1965; Suedfeld, 1964a; Suedfeld and Vernon, 1966). Also, concrete-simple persons were found to be more sensitive to conformity and deviance in others (Streufert, 1966).

Schroder, Driver, and Streufert (1967) explain the contradictory results obtained in these studies of conformity and attitude change as due to differences in the saliency of the propaganda or conflicting information which was presented. They hypothesize that attitude change will be greater among concrete-simple persons when the new information is made highly salient by sensory deprivation, statements from an authority, group pressure, and the like. They predict greater attitude change among abstract-complex persons when the new information is not highly salient. They contend that the abstract-complex person tends to be sensitive to a broad range of information, regardless of saliency, whereas the concrete-simple person is less likely to respond to new and conflicting information unless it is highly salient.

There are indications that aggression follows frustration more quickly among concrete-simple persons than among abstract-complex persons. In several unpublished studies by Brooks and Highland, cited by Schroder et al. (1967, p. 140), failure in a group task situation led concrete-simple persons to rate each other more unfavorably than did abstract-complex persons. Driver (1962) found that groups of concrete-simple persons performed a greater number

of aggressive acts and aggressive acts of a more serious nature within the context of a military-political game than did abstract-complex persons. Aggression by the concrete-simple groups was often irrational; it occurred even when it was not likely to result in obtaining a desired goal. It should be noted that some concrete-simple groups were composed of persons with low scores on violence and these groups did not resort to aggression, no matter how high the stress level.

Streufert (1970) found that the complexity of environmental stimuli affected differentiation and integration processes differently. High environmental complexity was associated with a decrease in integration scores but not in differentiation scores. Abstract-complex and concrete-simple groups were not significantly different on differentiation measures but they did differ significantly on the integration measures, i.e., abstract-complex groups had higher integration scores, particularly at moderate levels of environmental complexity.

Correlations between intelligence and integrative complexity have varied from .12 to .50, with a correlation of .46 obtained in the largest sample studied (Schroder et al., 1967, pp. 121-122). Thus, it is important to control for intelligence in studies of integrative complexity as was done in most of the studies which have been mentioned. In a study by Richardson and Soucar (1971), no significant

correlations were obtained between complexity scores and several measures of achievement and adjustment. Sex differences in integrative complexity have not been reported, although this may be because they have not been focused on to any great extent.

In generalizing from the studies of integrative complexity which have been reviewed, it appears that abstract-complex persons, in contrast to concrete-simple persons, are more creative and are able to process information more effectively, particularly when large amounts of information have to be integrated but they are less certain of their judgments based upon this information. This superiority in information processing does not mean that they perform more successfully in all types of problem-solving situations. The abstract-complex and concrete-simple conceptual systems represent two different cognitive approaches; each approach is likely to be more successful in some situations than in others.

Abstract-complex and concrete-simple persons differ in their views of success and failure, and in the way in which they resolve conflicts. Abstract-complex persons are more resistant to attitude change when certain pressures are imposed such as propaganda or sensory deprivation but exhibit greater attitude change under neutral conditions, perhaps because of their openness to information of all kinds and their superior ability in integrating such information.

There are indications that abstract-complex persons are less likely to resort to aggression under frustrating conditions. Although they tend to be independent and prefer to maintain a certain distance from others by revealing little personal information about themselves, abstract-complex persons are sensitive in their perceptions of other people and are inclined to view others as unique and individual.

Sex Differences in Cognitive Complexity

Sex differences have been noted on some measures of cognitive complexity while on others no such differences have been found. Barron reported no significant sex differences in his research with the Barron-Welsh Art Scale but Schaefer (1968), who administered the scale to a large group of high school students, found that girls achieved significantly higher scores than boys.

In research with the REP Test, sex differences were noted in a few studies. For example, Bieri, Bradburn, and Galinsky (1958) found that complexity was associated with field independence in males but not in females. Sechrest and Jackson (1961) administered the REP Test and Barron-Welsh Art Scale to a group of female nursing students. They found that the most complex members of the group were not described as temperamental and unconventional, as Barron had found with males, but were described as pleasant, competent, and typical of the group. In discussing the differences between

Barron's findings and those of Sechrest and Jackson, Bieri (1961) hypothesized that the personality characteristics related to complexity preference may be more typical of the feminine role than of the masculine role since in Barron's research complexity in males was associated with feminine and aesthetic interests. Therefore, according to Bieri, complexity in females may not be associated with deviance but with conformity to the feminine role.

Harvey, Hunt, and Schroder, and their colleagues reported no sex differences in studies of integrative complexity. In studies of complexity preference by Berlyne and his associates, no significant sex differences were found. However, significant male-female differences were noted on the polygon preference measure used by Eisenman and his associates. They found that females preferred complex polygons significantly more often than did males.

It appears that there is enough evidence of sex differences in cognitive complexity to warrant a more extensive investigation of this variable. There are indications that complexity in females may be associated with personality characteristics different from those that accompany complexity in males. In most instances where significant sex differences were found, females tended to score higher on complexity than males. These findings are intriguing but require further exploration.

Summary of Cognitive Complexity Research

On the basis of Barron's research, we find that the cognitively complex person is an independent and unconventional individual who experiences more subjective distress and considers himself more unstable than does the cognitively simple person. Also, the complex person tends to have aesthetic interests and a high regard for creativity.

The work of Bieri and others in the area of interpersonal perception indicates that the complex person is sensitive in perceiving other people. He is aware of subtle differences between people and differences between himself and others. Since he has many categories available for evaluating others, he is able to perceive the uniqueness and individuality of each person. The complex person is able to integrate incongruent information and feels more confident in dealing with this type of information than does the cognitively simple person.

The cognitively complex person as described in the research of Harvey, Hunt, and Schroder and their associates tends to be creative, independent, and sensitive in perceiving other people. He is resistant to attitude change when pressures are imposed but is more open to new information under neutral conditions than is the cognitively simple person. The complex person is able to effectively process larger amounts of information than is the less complex person.

Eisenman and his associates have found that the person who prefers complex stimuli is creative, independent, not easily influenced by persuasion techniques, and able to integrate incongruent information. From the work of Berlyne and others, we find that persons preferring complex stimuli have higher arousal levels than those preferring simple stimuli.

The composite picture of the cognitively complex person which emerges from the research of these different investigators is that of an independent and creative individual who is sensitive in his perceptions of other people and who is able to effectively integrate large amounts of information and information of an incongruent or contradictory nature.

Theoretical Orientations Among Psychologists

In comparison to cognitive complexity, very little research has been done in the area of theoretical orientations among psychologists. Actually, very little research has been done in any area where psychologists themselves are the subject of study. As a result, the empirical information about psychologists which is available is quite limited.

Roe (1953a, 1953b) studied eminent men in physics, biology, anthropology, and psychology. She found that psychologists and anthropologists were more verbally productive on the TAT and Rorschach and evidenced more concern with

social relationships than did the biologists and physicists. Shyness and social isolation in childhood were more evident among the physicists and biologists.

Cattell and Drevdahl (1955) compared the scores of eminent biologists, physicists, and psychologists on the Sixteen Personality Factor Questionnaire (16 PF). They found that this group, as a whole, tended to be relatively stable, free from anxiety, emotionally sensitive, socially introverted, and unconventional in their ideas. Psychologists differed from physicists and biologists in being somewhat less socially introverted and more unconventional in their ideas.

Galinsky (1961) compared twenty graduate students in clinical psychology with twenty graduate students in physics. As in Roe's studies, physics students tended to be more socially isolated during childhood. In comparison, psychology students had more peer relationships in childhood and closer relationships with their mothers who disciplined them by an appeal to feelings. Physics students were usually disciplined by their fathers who emphasized obedience rather than feelings.

More research studies of psychologists seem to have been conducted in clinical psychology than in other areas of psychology. Most of these studies have been aimed at distinguishing successful from unsuccessful psychotherapists or matching patient and therapist on certain personality

variables. In reviewing some of these studies, Swensen (1971) noted that a concern for people and a willingness to become involved with them have been found to be the most important qualities of a successful psychotherapist.

In studying the interest patterns of female psychologists on the Strong Vocational Interest Blank (SVIB), Campbell and Soliman (1968) found that the younger females had interest patterns very similar to those of the older group although there was a tendency for the younger female psychologists to be somewhat more intellectual but less scientific than the older group. Lonner and Adams (1972) found a striking similarity in the SVIB interest patterns of male psychologists in nine western countries including Germany, England, New Zealand, South Africa, and the United States.

Bachtold and Werner (1970, 1971) compared the 16 PF profiles of female psychologists to the profiles of women in general, academic men, and male psychologists. The female psychologists differed significantly from the general population of women on 14 of the 16 personality factors. Compared to women in general, the female psychologists were more intelligent, assertive, independent, radical, and open to new experiences. Compared to academic men, the female psychologists were more intelligent, radical, and impulsive but lower in ego strength. In comparison to male psychologists, the younger female psychologists were just as dominant but were more impulsive and less self-confident. Bachtold and

Werner (1971) noted that in comparison to older female psychologists, the younger females were more tough-minded and self-sufficient but also more insecure. In comparing the 16 PF profiles of females in clinical, counseling, and developmental psychology, it was found that the clinical psychologists were the most insecure, the developmental psychologists tended to be aloof, independent, and tense and the counseling psychologists were warm, sociable, and confident.

Most analyses of the theoretical orientations of psychologists have involved logical classifications on the basis of theoretical issues or schools of psychology. The first major attempt to delineate theoretical orientation variables by means of factor analysis of empirical data was made by Coan (1968). Ratings of 54 well known theorists on 34 theoretical variables were obtained from 232 psychologists throughout the United States. These ratings were subjected to factor analysis which yielded six factors identified as subjectivistic vs. objectivistic, holistic vs. elementaristic, transpersonal vs. personal, quantitative vs. qualitative, dynamic vs. static, and endogenist vs. exogenist. Two second-order factors were identified as synthetic vs. analytic and functional vs. structural. A weak third-order factor was labeled fluid vs. restrictive.

In a subsequent study, Coan (1973) obtained the responses of 298 APA members to 120 questionnaire items

pertaining to theoretical orientation. The items were more numerous and more specific in content than in the earlier study and, thus, were expected to yield more specific factors. Factor analysis of the data yielded 17 first-order factors and 5 second-order factors. A third-order factor was identified and found comparable to the fluid vs. restrictive dimension obtained in the earlier study. Although factor analysis of the questionnaire items revealed several new factors, most of the factors identified in the first study were represented on some level in the second study.

Coan (1973) has compared the fluid vs. restrictive dimension, which underlies most of the factors which he isolated, to William James' (1907) classification of philosophers into tender-minded and tough-minded types. The psychologist with a fluid orientation is concerned with conscious experience, seeks to understand people as totalities, and is willing to use rather loose and informal methods of study. The psychologist with a restrictive orientation confines his attention to observable behavior, is more rigorous and precise in his theoretical formulations, and tends to use the methods of the natural sciences.

The relationship between theoretical orientation variables and personality variables has been explored in only a few studies. Shaffer (1953) developed an attitude scale to measure a dimension of theoretical orientation which he called intuitive vs. objective. He found that this

dimension was associated with various aspects of the training, interests, and professional activities of psychologists.

Fisher and Fisher (1955) found that the intuitive-objective variable was related to anxiety among graduate students in psychology. Students with an intuitive orientation manifested higher levels of anxiety than students with an objective orientation. Obviously, the personal determinants of theoretical orientation need to be explored much further than has been done at the present time.

Hypotheses

The purpose of this study was to investigate the relationship between the cognitive style variable of complexity-simplicity and the theoretical orientation factors measured by the Theoretical Orientation Survey developed by Coan (1968, 1973). It was expected that the complexity or simplicity of an individual's cognitive style would be related to his theoretical approach to the subject matter of psychology.

Complexity-simplicity was measured by four instruments: The REP Test, the Barron-Welsh Art Scale, the Berkowitz Complexity Preference Scale, and the Budner Intolerance of Ambiguity Scale. It was expected that these tests would each tap somewhat different aspects of complexity-simplicity, thus providing a more comprehensive measure of this variable than any one of the tests used separately.

The hypotheses to be tested in this study were stated as follows:

1. A significant correlation between complexity and a "subjectivistic" theoretical orientation was predicted.

2. It was expected that there would be significant differences between the scores of individuals specializing in different areas of psychology. It was predicted that clinicians, as a group, in contrast to psychologists with an experimental or physiological orientation, would exhibit a more "tender-minded" theoretical approach represented by higher scores on subjectivism and related factors. It was also predicted that clinicians would obtain higher complexity scores on the complexity-simplicity measures.

3. It was hypothesized that there would be sex differences in complexity-simplicity and in theoretical orientation. Females were expected to score higher on complexity and on subjectivism and other related theoretical orientation factors.

4. It was expected that the intercorrelations between the four complexity-simplicity measures would be low, replicating the findings of Vannoy (1965), Messick and Kogan (1966), and others.

METHOD

Subjects

Fifty individuals participated in the study, 26 psychologists and 24 psychology graduate students. Twenty-three of the subjects had doctoral degrees, 9 had master's degrees, and 18 had bachelor's degrees. The group consisted of 28 males and 22 females ranging in age from 22 to 59. The mean age was 32.8. Forty-one of the subjects were faculty members or graduate students in the Department of Psychology at The University of Arizona. The remaining 9 subjects were employed as psychologists in a mental health center, psychiatric hospital, consulting firm, and a junior college. Of the various specialty areas in psychology, 20 of the subjects had specialized in clinical, 6 in experimental, 8 in physiological, 4 in social, 6 in developmental, 3 in counseling, 2 in psycholinguistics, and 1 in general psychology.

Instruments

Theoretical Orientation Survey

This instrument, developed by Coan (1968, 1973), consists of 63 items yielding scores for the following 10 factors of theoretical orientation: factual vs. theoretical

orientation, impersonal causality vs. personal will, experiential vs. behavioral content emphasis, holism vs. elementarism, biological determinism, environmental determinism, physicalism, quantitative vs. qualitative orientation, objectivism vs. subjectivism, and endogenism vs. exogenism. Responses to the items were recorded on a 5 category Likert-type scale.

REP Test

The REP Test was developed by George Kelly (1955). In this test, the subject is asked to indicate the similarities and differences between people occupying various roles in his life such as father, mother, disliked person, friend, and so on. These people are compared in triads. The subject is asked to name the way in which two people in the triad are similar to each other but different from the third. The subject also names the opposite of the way in which the two people are similar. The way in which the two people are similar is referred to as the "construct" and its opposite is referred to as the "contrast." The combination of a construct and a contrast is considered as a verbal dimension. The score for cognitive complexity is the total number of different verbal dimensions given by the subject on all of the comparisons. If either the construct or contrast is identically repeated in a subsequent comparison, this is considered as a repetition and is not counted. The highest

score for cognitive complexity is obtained when neither the construct nor the contrast is repeated in any of the comparisons. On the group form of the REP Test used in this study, a subject could receive a complexity score ranging from 1 to 15, with 1 indicating most simple and 15 indicating most complex.

Barron-Welsh Art Scale (Revised)

This is an 86 item scale developed by Barron and Welsh (1952) consisting of black and white drawings which the subject responds to by indicating whether he likes or dislikes each drawing. Some of the drawings are highly complex while others are relatively simple. According to Barron and Welsh, the complex person prefers the complex drawings while the simple person prefers the simple drawings. A high score on this scale is associated with complexity and a low score with simplicity.

Complexity Preference Scale

This scale, consisting of 18 items, was developed by Berkowitz (1957). A high score indicates a preference for complex stimuli in such realms as art, social relationships, politics, and ideas. Subjects responded to the items on a Likert-type scale with 7 categories ranging from "strongly agree" to "strongly disagree."

Intolerance of Ambiguity Scale

This is a 16 item scale developed by Budner (1962). The items were designed to measure intolerance of ambiguity in such areas as reaction to authority, unconventional behavior, the values and ideals of other persons, and unfamiliar situations. This scale was one of the instruments used by Vannoy (1965) in his comprehensive study of a number of different measures of cognitive complexity. A seven category Likert-type scale was used for responses to the items with a high score indicating intolerance and a low score indicating tolerance.

Procedure

The subjects were contacted individually by the experimenter and asked to participate in the study. Those who were willing to participate were given an envelope containing the Theoretical Orientation Survey and the four complexity-simplicity measures. They were asked to complete the tests during their free time and return them to the experimenter. Eighty-seven individuals agreed to participate in the study and, of these, 50 returned completed test forms which represents a return rate of 57 percent. The subjects were contacted and data collected during the spring of 1973.

RESULTS

The data obtained from the 50 subjects were analyzed by means of product-moment correlation coefficients. The means, standard deviations, and intercorrelations of the 4 complexity-simplicity measures and the 10 theoretical orientation factors are shown in Table 1.

The correlations between the theoretical orientation factors will not be discussed since they are not directly related to the hypotheses which were tested in this study. It is evident from Table 1 that the REP Test was the only complexity-simplicity measure which was significantly correlated with theoretical orientation. The results show that high complexity scores on the REP Test, indicating the use of a number of different constructs in describing people, were associated with the second-order factor of subjectivism and with all of the component elements of this factor, namely, personal will, experiential content emphasis, holism, little emphasis on physicalism, and a qualitative rather than quantitative orientation. (Although the correlations for the factors of personal will and holism did not reach significance, they were in the same direction as the other components of subjectivism and approached significance.)

TABLE 1. Correlations, Means, and Standard Deviations of the Scores of Fifty Psychologists on Ten Theoretical Orientation Factors and Four Complexity-Simplicity Measures. (N=50)

Variable	Correlations								
	1	2	3	4	5	6	7	8	
1. Factual vs. theoretical	1.000								
2. Impersonal vs. personal cause	.285*	1.000							
3. Behavioral vs. experiential	.126	.560**	1.000						
4. Elementarism vs. holism	.279*	.512**	.550**	1.000					
5. Biological determinism	-.224	-.374**	-.204	-.217	1.000				
6. Environmental determinism	.131	.559**	.303*	.343*	-.711**	1.000			
7. Physicalism	.241	.625**	.722**	.553**	-.284*	.358*	1.000		
8. Quantitative vs. qualitative	.190	.442**	.367**	.464**	-.120	.174	.477**	1.000	
9. Objectivism vs. subjectivism	.282*	.826**	.828**	.754**	-.307*	.451**	.854**	.662**	1
10. Endogenism vs. exogenism	-.190	-.507**	-.276	-.305*	.921**	-.929**	-.348*	-.160	-
11. Barron-Welsh Art Scale	.136	-.060	.009	.041	-.114	.025	.017	-.161	-
12. REP Test ¹	-.117	-.236	-.381**	-.278	-.082	-.071	-.352*	-.320*	-
13. Complexity Preference Scale	-.031	.038	-.222	.067	-.050	-.047	-.133	-.015	-
14. Intolerance of Ambiguity Scale	.004	.040	.212	.045	-.153	.087	.133	.071	.

¹N = 48 on the REP Test because 2 S's failed to complete the test.

*p < .05.

**p < .01.

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7	8	9	10	11	12	13	14	\bar{X}	SD	#
								18.400	4.490	1
								24.220	7.822	2
								21.360	6.830	3
								22.100	4.908	4
								22.780	6.409	5
								26.040	6.767	6
* 1.000								19.580	5.722	7
.477**	1.000							22.360	5.078	8
** .854**	.662**	1.000						109.420	23.900	9
** -.348*	-.160	-.412**	1.000					46.740	12.187	10
.017	-.161	-.033	-.074	1.000				36.740	11.568	11
-.352*	-.320*	-.402**	-.004	-.092	1.000			12.875	2.170	12
-.133	-.015	-.063	-.000	.332*	.099	1.000		85.660	13.114	13
.133	.071	.150	-.129	-.322*	-.101	-.396**	1.000	41.480	8.269	14

he test.

Although the correlations did not reach significance, there was a tendency for high scores on the Complexity Preference Scale and a high tolerance of ambiguity to be associated with an experiential rather than behavioral emphasis. The only complexity-simplicity measure which did not significantly correlate, or show any noteworthy correlational trends, with any of the theoretical orientation factors was the Barron-Welsh Art Scale.

The correlations between scores on the Barron-Welsh Art Scale, Complexity Preference Scale, and Intolerance of Ambiguity Scale were low but significant as indicated in Table 1. Scores on the REP Test were not significantly related to scores on the other three complexity measures, indicating that the REP Test was measuring a different aspect of complexity than the other measures.

Table 2 shows the correlations of theoretical orientation and complexity-simplicity with sex, age, and experimental-physiological vs. clinical specialization in psychology. In Table 2, positive correlations indicate that individuals specializing in experimental or physiological psychology scored higher on the theoretical orientation factors or complexity-simplicity measures than did clinicians. The reverse is true of negative correlations.

As Table 2 indicates, there were significant correlations of theoretical orientation and complexity-simplicity with experimental-physiological vs. clinical specialization

TABLE 2. Correlations of Complexity-Simplicity and Theoretical Orientation with Sex, Age, and Experimental-Physiological vs. Clinical Specialization in Psychology.

Variable	Correlations		
	Sex N = 50	Age N = 50	Experimental- Physiological vs. Clinical N = 34
1. Factual vs. theoretical	.297	-.104	.220
2. Impersonal vs. personal cause	.124	-.210	.440**
3. Behavioral vs. experiential	.125	-.066	.684**
4. Elementarism vs. holism	-.015	-.224	.453**
5. Biological determinism	.045	.089	-.029
6. Environmental determinism	-.067	-.165	.203
7. Physicalism	.133	-.242	.557**
8. Quantitative vs. qualitative	.104	-.029	.362*
9. Objectivism vs. subjectivism	.120	-.202	.629**
10. Endogenism vs. exogenism	.061	.138	-.127
11. Barron-Welsh Art Scale	-.006	-.103	.082
12. REP Test ¹	.027	-.008	-.183
13. Complexity Preference Scale	-.216	-.120	-.465**
14. Intolerance of Ambiguity Scale	.008	.138	.090

¹For the REP Test, the correlations for age and sex are based on an N of 48, while the correlation with experimental-physiological vs. clinical is based on an N of 32.

*p < .05.

**p < .01.

in psychology. Individuals specializing in experimental or physiological psychology scored significantly higher than clinicians on the theoretical orientation factors of impersonal causality, behavioral emphasis, elementarism, physicalism, quantitative orientation, and objectivism. Clinicians obtained significantly higher complexity scores than did the experimental-physiological group on the Complexity Preference Scale.

Age was not significantly correlated with any of the variables. The only significant correlation between sex and theoretical orientation indicated that females were more inclined to be theoretically oriented than males. The correlations of sex with age and experimental-physiological vs. clinical specialization were $-.129$ and $.120$, respectively. The correlation of age and area of specialization was $.236$.

In order to further evaluate the effects of area of specialization and sex on complexity-simplicity and theoretical orientation, an analysis of variance was computed by means of the least-squares procedure for unequal groups. The results of the analysis of variance are presented in Table 3. For purposes of data analysis, the subjects were divided into three groups on the basis of area of specialization. The three groups were designated as clinical (N=20), experimental-physiological (N=14), and a heterogeneous group labeled "other" (N=16) consisting of individuals specialized in such

TABLE 3. Least-Squares Analysis of Variance of Complexity-Simplicity and Theoretical Orientation by Sex and Area of Specialization. (N=50)

Source	Sex			Area			Sex x Area			Error	
	df	MS	F	df	MS	F	df	MS	F	df	MS
1. Factual vs. theoretical	1	60.070	3.069	2	15.186	.776	2	4.876	.249	44	19.571
2. Impersonal vs. personal cause	1	26.960	.463	2	172.263	2.959	2	13.421	.231	44	58.214
3. Behavioral vs. experiential	1	9.895	.295	2	378.147	11.262**	2	13.982	.416	44	33.578
4. Elementarism vs. holism	1	5.759	.261	2	83.875	3.806*	2	16.831	.764	44	22.038
5. Biological determinism	1	4.421	.097	2	2.998	.066	2	2.752	.061	44	45.383
6. Environmental determinism	1	9.269	.195	2	59.318	1.247	2	5.008	.105	44	47.560
7. Physicalism	1	9.842	.388	2	192.379	7.594**	2	23.590	.931	44	25.334
8. Quantitative vs. qualitative	1	12.358	.512	2	57.806	2.397	2	30.343	1.258	44	24.119
9. Objectivism vs. subjectivism	1	124.982	.283	2	3801.591	8.603**	2	110.851	.251	44	441.871
10. Endogenism vs. exogenism	1	26.492	.164	2	57.657	.356	2	1.401	.009	44	161.835
11. Barron-Welsh Art Scale	1	19.311	.135	2	46.236	.323	2	81.278	.568	44	143.178
12. REP Test ¹	1	.005	.001	2	12.871	2.804	2	.531	.116	42	4.590
13. Complexity Preference Scale	1	298.929	1.876	2	510.592	3.204	2	3.635	.023	44	159.356
14. Intolerance of Ambiguity Scale	1	1.992	.027	2	38.192	.514	2	.276	.004	44	74.332

¹N = 48 on the REP Test
 *p < .05.
 **p < .01.

areas of psychology as social, developmental, counseling, and psycholinguistics.

As Table 3 shows, there were no significant sex effects. The largest sex effect, although it did not reach significance, occurred with regard to factual vs. theoretical orientation with females tending to be more theoretically oriented than males as had been indicated by the correlational data. There were no significant interaction effects of sex and area of specialization. However, there were significant area effects with regard to the factors of behavioral vs. experiential, elementarism vs. holism, physicalism, and objectivism vs. subjectivism. The analysis of variance revealed no significant effect of area on the four complexity measures although the relationship of area and complexity nearly reached significance with regard to scores on the Complexity Preference Scale.

Since the analysis of variance had indicated that there were significant differences between the three specialization groups in terms of theoretical orientation, the direction of these differences was determined by the Student-Newman-Keuls procedure for separating least-squares means (Steel and Torrie, 1960, p. 114; Duncan, 1970, p. 143-144). The results of this analysis are shown in Table 4.

It can be seen from Table 4 that the experimental-physiological group obtained significantly higher scores than did the group of clinicians on the factors of impersonal

TABLE 4. Least-Squares Means of Three Specialization Groups on Ten Theoretical Orientation Factors and Four Complexity-Simplicity Measures.

Note: Means having the same letter are not significantly different from each other at the .05 level. Means having double letters are not significantly different from the other two means.

Variable	Group		
	Clinical N = 20	Experimental- Physiological N = 14	Other N = 16
1. Factual vs. theoretical	17.3636 ^a	19.2083 ^a	18.6545 ^a
2. Impersonal vs. personal cause	21.5000 ^a	28.0208 ^b	24.1455 ^{ab}
3. Behavioral vs. experiential	17.8182 ^a	27.3750 ^b	20.4364 ^a
4. Elementarism vs. holism	20.4091 ^a	24.9583 ^b	22.3545 ^{ab}
5. Biological determinism	23.1717 ^a	22.7292 ^a	22.3182 ^a
6. Environmental determinism	25.7172 ^a	28.6042 ^a	24.6091 ^a
7. Physicalism	17.3182 ^a	24.0833 ^b	18.8909 ^a
8. Quantitative vs. qualitative	20.7020 ^a	24.4792 ^a	22.2909 ^a
9. Objectivism vs. subjectivism	97.7475 ^a	128.2917 ^b	108.1182 ^a
10. Endogenism vs. exogenism	47.4545 ^a	44.1250 ^a	47.7091 ^a
11. Barron-Welsh Art Scale	35.3636 ^a	37.5417 ^a	38.6091 ^a

TABLE 4, Continued.

<u>Variable</u>	<u>Group</u>		
	Clinical N = 20	Experimental- Physiological N = 14	Other N = 16
12. REP Test ¹	12.7323 ^a	11.8000 ^a	13.8091 ^a
13. Complexity Pref- erence Scale	89.8586 ^a	78.8750 ^b	87.4818 ^{ab}
14. Intolerance of Ambiguity Scale	41.6717 ^a	43.0625 ^a	39.7455 ^a

¹For the REP Test, the experimental-physiological N is 12.

causality and elementarism. The experimental-physiological group also scored significantly higher on behavioral content emphasis, physicalism, and objectivism than did either the clinicians or "other" group. Clinicians, as a group, obtained significantly higher scores on the Complexity Preference Scale than did the experimental-physiological group.

DISCUSSION

All of the hypotheses upon which this study was based received some support from the data. The hypothesis that the cognitive style variable of complexity-simplicity would be significantly related to an individual's theoretical approach to the subject matter of psychology was confirmed by evidence from the REP Test. High complexity scores on the REP Test were associated with a subjectivistic theoretical approach which included such factors as personal will, holism, an emphasis on experiential rather than behavioral evidence and a qualitative rather than quantitative orientation with little emphasis on physicalism. It can be concluded from these results that psychologists with a subjectivistic theoretical orientation are likely to have a relatively complex cognitive system, at least in the realm of interpersonal perception.

The other complexity-simplicity measures were not significantly related to theoretical orientation although there was tendency for high scores on the Complexity Preference Scale and low scores on the Intolerance of Ambiguity Scale to be associated with an experiential rather than behavioral emphasis. Scores on the Barron-Welsh Art Scale, however, were not closely associated with any of the theoretical orientation variables. Perhaps the fact that

the Art Scale was the only nonverbal complexity measure used and the only complexity measure which was unrelated to interpersonal perception may have contributed to the low correlations between complexity scores on this measure and theoretical orientation.

The data provided considerable evidence that area of specialization in psychology is significantly related to theoretical orientation. As might be expected, experimental and physiological psychologists tended to score significantly higher than clinical psychologists on such factors as objectivism, impersonal causality, elementarism, physicalism, and behavioral content emphasis. Clinicians scored significantly higher on the Complexity Preference Scale. However, there were no significant differences between the clinical group and the experimental-physiological group on the other three complexity measures.

Sex differences were not as pronounced as had been expected. The only significant male-female difference in theoretical orientation occurred on the factual vs. theoretical factor, with females tending to be more theoretical and males more factual. On the basis of this finding, it appears that female psychologists are more inclined toward theory, speculation, and interpretation of data whereas male psychologists are more inclined toward the collection of factual information. This finding is interesting in light of the fact that most of the outstanding theoreticians in

psychology have been males. Considering the results of the present study, the reason for the predominance of male theorists in psychology would seem to be that, traditionally, the majority of psychologists have been males, with very few females appointed to academic and research positions, rather than a lack of interest in theoretical issues on the part of female psychologists.

There were no significant sex differences in complexity-simplicity. Since the sample used in this study was homogeneous with regard to such factors as profession, educational level, and level of intelligence, one might expect fewer sex differences than would be found in the general population. It may be that at the higher levels of education and intelligence, differences between males and females are less pronounced than similarities with regard to cognitive factors such as complexity-simplicity and theoretical orientation. Also, intelligent and highly educated persons tend to have many of the interests and attitudes of the opposite sex which would tend to blur some of the male-female differences found in the general population. For example, on the MMPI masculinity-femininity scale, college educated males tend to obtain higher femininity scores and females with college training tend to obtain higher masculinity scores than is true of the general population.

The intercorrelations between the four complexity measures were low as had been predicted. There were low

but significant correlations between scores on the Barron-Welsh Art Scale, Complexity Preference Scale, and the Intolerance of Ambiguity Scale. However, the REP Test scores were not significantly correlated with scores on the other three measures which suggests that complexity in interpersonal perception is not necessarily associated with a preference for complex stimuli or a tolerance of ambiguity.

In summary, the results of this study indicated that a subjectivistic theoretical orientation in psychology is associated with cognitive complexity in the realm of interpersonal perception. Area of specialization in psychology was significantly related to theoretical orientation. As might be expected, experimental and physiological psychologists obtained higher scores on objectivism and related factors than did clinical psychologists. There was a significant relationship between area of specialization and cognitive complexity on only one of the four complexity measures, with clinical psychologists obtaining higher complexity scores than experimental and physiological psychologists.

The intercorrelations of the four complexity measures indicated that three of them were measuring a similar aspect of cognitive complexity, i.e., a general preference for complex experiences of various kinds, whereas the other measure, the REP Test, appeared to tap a more specific realm of

cognitive complexity, that of differentiation in the perception of other people. There was no evidence of sex differences in complexity-simplicity. The sexes differed significantly on only one of the theoretical orientation factors, with females tending to be more theoretically oriented and males more factually oriented.

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