THE RELATIONSHIP BETWEEN INTENSITY OF BELIEF AND LEVEL OF COGNITIVE - COMPLEXITY

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This is to certify that the

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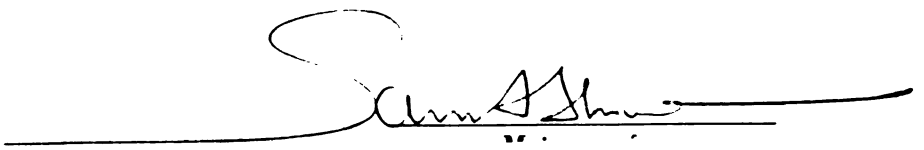

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ABSTRACT

THE RELATIONSHIP BETWEEN INTENSITY OF BELIEF AND LEVEL OF COGNITIVE-COMPLEXITY

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John F. Fielder

The author's purposes in this study were: (1) to examine the relationship between intensity of belief about a social attitude object and the level of cognitive-complexity exhibited by subjects on a task requiring them to deal with that object, and (2) to examine the validity of two different methods, hence heuristic theoretical conceptions, in assessing level of cognitive-complexity.

As predicted, a significant relationship was found to exist between intensity of belief as measured by an attitude scale and level of cognitive-complexity exhibited by subjects in writing an essay dealing with that stimulus domain the attitude represented. It was found that subjects with high intensity of belief about an attitude, whether for or against, exhibited a lower level of cognitive-complexity than did subjects who had a moderate intensity of belief about the attitude. Subjects with a moderate of belief about the attitude

object were found to be significantly higher in the level of cognitive-complexity exhibited ($P<.01$).

The significant relationship found to exist between belief intensity and level of cognitive-complexity was obtained through application of the Schroder technique for scoring structural variables (Schroder, et al., 1968). This measure of complexity of cognitive functioning focuses on exhibited structural variables taking into account, but not including, a specified stimulus domain. No such relationship was found to exist when a general measure of complexity (Barron, 1967) was given to the same subjects. Contingent upon the validity of the two techniques, the evidence supports a theoretical assertion of this study that cognitive-complexity should be assessed purely at a structural level and with reference to a specified stimulus domain.

The second measure of cognitive-complexity, the Barron general scale (Barron, 1967), was included in this study to help determine the validity of both techniques through the application of certain validational procedures. Interpreting the evidence in terms of the rationale underlying these procedures led to the conclusion that there is a reasonable basis for asserting the validity of the Schroder technique and that further study should be given to this approach to assessing levels of cognitive-functioning.

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By

John F. Fielder

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CHAPTER I

INTRODUCTION

General Introduction To Cognitive-Complexity

The concept of cognitive-complexity is central to theories of human information processing. Generally speaking, cognitive-complexity is a construct used to indicate the manner in which a person construes his social and physical world. The existence of this contruct is posited on the assumption of mediating cognitive structures through which a person's experiences with his social and physical world are processed.

Bieri has defined cognitive-complexity in terms of the degree of differentiation of a person's construct system, i.e., " . . . a person who is able to evoke more dimensions of judgement in construing others is more cognitively complex than a person who invokes fewer dimensions of judgement" (Bieri, 1966, p. 18). The idea of differentiation of mediational cognitive structures as used by Bieri is generally attributed to Kelly (1955).

Harvey, et al. (1961) took the complexity of a person's perceptions, as conceptualized by Bieri,

to be indicative of the degree of abstractness of his cognitive structures. In Harvey's formulation, a continuum of conceptual functioning was postulated. At one end of the continuum rest the simple or concrete structures, and at the other end rest the very complex or abstract structures. The concept of abstractness, as used by Harvey, refers to a person's ability to manipulate dimensions of experience without the necessity for their physical presence.

Schroder, et al. (1968), in a theory of personality functioning, developed a conception of cognitive-complexity which appears to resemble what Kelly had in mind more closely than did the conceptualizations of either Bieri or Harvey. Although Kelly never referred specifically to "cognitive-complexity" as a construct, he did use differentiation of cognitive structures as a central construct in his theory. Together with the ability to differentiate among the dimensions of a social situation, Kelly spoke also of the ability of a person to abstract trends from these combined dimensions (Kelly, 1955). The abstracted trend represents a synthesis or integration of the differentiated dimensions of a social situation. The more complex the differentiation and synthesis, according to Kelly, the more likely the person will be able to successfully predict outcomes of alternative responses to a social situation.

Schroder, et al. (1968) also used the concept of differentiation of cognitive structures in their theory of human information processing. And they added the concept of integration. The "trend abstraction" concept of Kelly's may be equated with the concept of integration. However, Schroder used the title of "integrative complexity" to represent an individual's ability to construe experiences in a multidimensional and abstract manner. For Schroder, the differentiated dimensions represent the units of conceptual functioning, i.e., the elements or content of thought. Synthesis or trend abstraction (integration rules) represents the styles, schema, programs or controls for combining the units of information which are variously called cues or stimuli (Schroder, et al., 1968, p. 258).

In Schroder's formulation, then, conceptual structures are made up of two interdependent parts. Level of cognitive-complexity (integrative-complexity) is a function of the dimensions or units of information perceived, differentiated and utilized, and also the complexity of the rules a person has available for integrating these dimensions of experience.

Essentially the concept of cognitive-complexity is relational in nature. In an information processing approach to personality functioning, a distinction is made between the content or elements of cognition, and the structure or processes of cognition. Structure is

viewed as referring to the relations between the elements or content of cognition (Scott, 1963, p. 266). For example, today, at one level of analysis, Israel and Egypt represent two elements of thought. The relationship seen to exist between these two countries represents the structure of a person's cognition.

Thus, level of complexity is seen to be indicative of an individual's ability to abstractly situate elements of cognition in such a manner that he might discern their differences and similarities, their oneness yet separateness. The cognitively-complex person, relatively speaking, sees gradation of grays while the cognitively-simple person sees but blacks and whites.

For the purposes of this study the conceptualization of cognitive-complexity (integrative-complexity) conceived by Schroder, et al. (1968) will be used. The problem of assessment of the construct is dealt with following the next section.

Problem: Theoretical Rationale for Study

Much recent literature, (Barron, 1953; Berkowitz, 1957; Bieri, 1955, 1961, 1966; Scott, 1962, 1963a, 1963b; Messick and Kogan, 1966) has dealt with the concept of cognitive-complexity. In most cases, cognitive-complexity has been conceptualized as an independent cognitive variable which influences a person's perceptions of his social and physical worlds. How a person

construes his physical and social environments has been seen to be primarily dependent upon his overall level of cognitive-complexity. The underlying assumption in most instances appears to be that there is a unitary trait of cognitive-complexity which influences all perceptions in like manner.

Notions as to the generality of cognitive-complexity have varied considerably. Some writers, e.g., Bieri and Blacker (1956) have viewed cognitive-complexity as a general personality trait which influences all perception in like manner. Gardner and Schoen (1962), on the other hand, assert that evidence indicates that most people can be relatively complex in some areas of perception while being relatively simple in others. Scott (1963a) asserts that evidence is weak for conceptualizing a unitary trait of cognitive-complexity which crosses all conceptual structures. Fielder (1969) has suggested that content related cognitive structures may be grouped in a finite number of constellations, each constellation varying from the others with respect to level of cognitive-complexity exhibited.

Schroder, et al. (1968) and Scott (1963b) have suggested that level of cognitive functioning is more a function of the content of cognition, and any assessment of structural properties must be made with reference to the particular stimulus domain under consideration.

Both authors stress the importance of focusing upon the relatedness of content variables to structural variables. The assertion is also made that a general measure of cognitive-complexity is of relatively small value in predicting level of cognitive functioning with regard to any specified stimulus object.

Schroder also has stated that evidence shows that the more concrete or simple a person's conceptual structure " . . . the more a person's functioning becomes rigidly determined by an absolute belief that structures the world in a fixed way" (Schroder, et al., 1968, p. 128). This suggests that an evaluative or belief dimension may indeed be the independent variable of cognitive functioning, i.e., the level of cognitive-complexity an individual exhibits regarding any social object may be a direct function of the intensity of the belief the person has about that object. Schroder also points out that " . . . the authoritarian person, the rigid person, and the dogmatic person have all been characterized as holding relatively extreme attitudes" (Schroder, et al., 1968, p. 128).

In the same view, Rokeach (1968) and Fishbein (1967) have both posited the existence of evaluative as well as cognitive dimensions in attitudinal structures. Also, since Osgood (1957) has shown that virtually any concept loads on an evaluative dimension, it becomes reasonable to believe that the level of cognitive-

complexity exhibited regarding any social object in which a judgement is to be made would therefore be dependent upon the intensity of belief a person has about that social object.

Consequently, if it is indeed the case that level of cognitive-complexity is a function of the intensity of belief that a person has about any social attitude object, it then follows that scores on any social attitude scale should be relatively good predictors of the level of cognitive-complexity individuals will exhibit regarding that object.

It was the author's purpose in this study to examine the relationship between intensity of belief about a specified stimulus domain (social attitude object), and the level of cognitive-complexity exhibited by individuals regarding that object.

The instrument used to assess level of cognitive-complexity was of a type which allowed consideration of content variables as well as structural variables. Level of cognitive-complexity was assessed with reference to a specified stimulus domain--this in direct contrast to the general type of instruments which purportedly assess level of cognitive-complexity with reference to structural variables alone. The problem of assessment is discussed in the following section.

Problem of Assessing Level of Cognitive-Complexity

Many attempts have been made to determine the generality of the personality trait of cognitive-complexity. In a study conducted by Bieri and Blacker (1956), a methodological issue and a theoretical issue were considered. Of methodological concern was whether a single empirical measure could sufficiently assess level of cognitive-complexity. Of theoretical concern was whether there is a general trait of cognitive-complexity which influences perception across all cognitive structures or, whether cognitive-complexity must be specified in terms of a specific stimulus domain.

For the purpose of their study, Bieri and Blacker used two different instruments to assess level of cognitive-complexity. They also made a distinction between two major divisions of stimulus environments. To test for complexity with regard to the social environment (perception of people), the Role Construct Repertory Test (RCR) (Kelly, 1955) was used.

A modification of the Rorschach ink blot (determinant-complexity and content-complexity) was used to test for complexity with regard to the nonhuman stimulus environment.

The Rorschach test of complexity was measured in terms of response variability in content and determinants of responses. The RCR test of complexity was measured in terms of the number of different verbal constructs elicited. Significant relationships were found to exist between responses to the RCR test and the Rorschach test (from $P<.005$ to $P<.05$) which led the authors to suggest that there are relatively enduring and consistent modes of cognitive functioning which are characteristic of a person's perception across both of the environments specified in the study.

Although significant relationships were found in this study, they do not appear useful in resolving the methodological nor theoretical problems posed by the authors. There is no evidence that the two instruments used were indeed measuring the same trait across the two stimulus environments. If there is a general trait of cognitive-complexity, then it is reasonable to expect that a single instrument measure the trait satisfactorily regardless of the stimulus domain involved. The procedure of using two different instruments to assess the same trait in two different stimulus environments raises strongly the question of validity.

Also, the authors failed to raise the question of generality of cognitive-complexity across different stimulus situations in either of the two environments under consideration. Had they tested for this

possibility, it might have been found that correlations between complexity scores would not always be high. It is possible that variability within each stimulus environment is quite large and a sample of only a few sub-domains is not adequate for making generalizations to the total stimulus environment.

Allard and Carson (1963) developed three tests of cognitive-complexity based on the RCR test. Generated constructs for the three tests of cognitive-complexity were: (1) personal friends, (2) famous people, (3) geometric designs. Intercorrelations between the three stimulus domains were from .57 to .67. The findings of this study also led the authors to suggest the existence of a unitary trait of cognitive-complexity. It is felt here, however, that the scope of the study was too limited for the generalizations made.

Vannoy (1965) examined a battery of twenty instruments which were designed to measure, or which were construed to measure cognitive-complexity. A factor analysis of subject's responses to the twenty instruments indicated that no single dimension could be held accountable for the derived correlation. In all, eight factors were extracted, the largest accounting for 24.3 per cent of the total variance.

Vannoy's conclusion from the results was that cognitive-complexity is not as general a trait as is often implied. It is doubtful, however, that this

conclusion was warranted. In the first place, the large number of factors extracted reflects upon the construct validity of the instruments purportedly assessing level of cognitive-complexity. Alternative hypotheses would suggest that either differences in theoretical conceptualizations of the construct vary, or that none of the instruments indeed measures the construct.

It was also noted in the Vannoy study that the Schroder measure of integrative complexity (sentence completion test) represented a single factor in itself. Out of the total variance, this factor accounted for 6.3 per cent. The reason the Schroder measure of complexity was represented on a single factor was attributed to the fact that all other instruments tested in the study were essentially measures of dimensional complexity. This would seem to be in keeping with Bieri's (1966) definition of cognitive-complexity which is stated in terms of differentiation of a person's construct system. Thus, the more differentiated or dimensionalized a person's construct system, the more cognitively-complex he is.

It therefore appears that there are two divergent streams of thought regarding the construct cognitive-complexity. The followers of one stream see cognitive-complexity as being essentially dimensional in nature.

This conceptualization has been utilized by many writers in developing multidimensional scaling models for assessing the dimensionality of cognition (Messick and Kogan, 1966; Jackson and Messick, 1963; Tucker and Messick, 1963).

However, it has been previously noted that cognitive-complexity is seen by some writers to be more than just an ability to differentiate among informational dimensions. The second stream of though regarding this construct requires an integrative or synthesis dimension, as well as the dimension of differentiation. This is in keeping with the theory of personality developed by Kelly (1955), and as most recently posited, by Schroder, et al. (1968).

It is consequently the case that while dimensional analysis can be quite useful in the study of cognitive structures, it is not in itself sufficient to the determination of level of cognitive functioning regarding a specified stimulus situation. As yet, there appears to be no evidence which would support the assertion of a general trait of cognitive-complexity. What seems to be required is a measure of cognitive-complexity which accurately depicts the ability of an individual to abstract trends from the dimensions of any situation in a complex manner. Also, this measure should be able to take into consideration the particular stimulus domain being considered (Scott, 1963b; Schroder, et al., 1968).

Even from a purely subjective standpoint there does not appear to be sufficient evidence for postulating a constant or general trait of cognitive-complexity. For example, a person might be very complex in construing the behavior of members of his own ethnic group, but, on the other hand, may be extremely categorical when construing the behavior of persons belonging to some other ethnic group. One does not have to search far to find a person who is extremely categorical when it comes to religion, but who may be extremely noncategorical with respect to politics.

Situationally, also, level of cognitive-complexity may vary with respect to the same object. For example, a person's perception of foreigners generally becomes much less complex in time of war. A case in point is the treatment of Japanese-Americans following Japan's attack on Pearl Harbor. Disregarding even the fact that some of these people were second generation Americans, most were categorized as "Japanese" and incarcerated as such.

Considering the theoretical requirements of this study, the most promising approach to assessing level of cognitive-complexity appears to be Schroder's "general manual" for scoring structural properties of responses. In essence, " . . . the general manual represents a set of general operations for inferring the level of conceptual structure that generated the

response. The manual directs the rater to consider the degrees of freedom in the rules of integration in the mediating processes underlying the response" (Schroder, et al., 1968, p. 190).

In all instances where the "general manual" has been used it has been possible to specify the stimulus domain under consideration. And, although the reference is to a specified content or stimulus domain, the trained rater does not consider content referents in scoring, but is told, " . . .regardless of what the persons says, what complexity of structure would be required to generate the response?" (Schroder, et al., 1968, p. 190).

The "general manual" has been used to score responses generated by sentence stems, (Schroder and Streufert, 1962), and also in scoring conceptual rules involved in the writing of essay answers to examination questions, (Claunch, 1964; Schroder and Phares, 1965). "The essay appears to provide the optimal opportunity (in contrast to responses generated by sentence stems) for a person to utilize high level conceptual rules" (Schroder, 1968), p. 200).

Claunch (1964) examined the level of conceptual (cognitive) complexity exhibited by individuals in writing essay examinations. Using the Schroder Sentence Completion Test of Integrative Complexity (Schroder and Struefert, 1962), two groups of subjects were selected.

The first group was composed of individuals judged to be concrete (simple) in conceptual functioning, and the second group was composed of individuals judged to be abstract (complex) in conceptual functioning. The Sentence Completion Test was used as an independent variable so as to in part validate the "general manual" of structural variables to be used in scoring the essays. The essay question to be answered by the subjects was judged to be sufficiently related in content to the Schroder Sentence Completion Test. Content relatedness of the two tests was necessary to rule out the alternative hypothesis of differences in conceptual functioning due to differences in the stimulus domains examined.

The type of essay question itself was chosen for several reasons. In the first place, the question dealt with two theories complex enough in nature that they were thought to provide an adequate number of concepts within themselves for subjects to make comparisons, contrasts, and integrations. Secondly, the two theories to be dealt with had been presented to the subjects previously in such a way that the author could be reasonably certain that integrations and comparisons necessarily would be generated internally by the subjects, and not from memory alone. Finally, it was felt that asking the subjects to make comparisons between two theories provides an excellent opportunity

for the use of conceptual rules which would distinguish the cognitively concrete (simple) from the cognitively abstract (complex) person.

The structural variables tested in this study were polarized contrasts, qualified contrasts, and integrative contrasts. It was hypothesized that the cognitively complex individuals would use more qualified contrasts and integrative contrasts than would the more cognitively simple individuals. This hypothesis was supported in the study. It was also hypothesized that the less cognitively-complex individual would use significantly more polarized-contrasts than would cognitively-complex individuals. This hypothesis was not supported statistically at $P<.05$. However, results were in the predicted direction and sigificant at $P<.10$.

Claunch's study was important in that results showed that structural variables can be successfully used as criteria by trained raters to assess level of cognitive functioning. It also gives added support to the use of essay type exams to elicit responses which will be indicative of a person's level of cognitive-complexity regarding a specified stimulus domain.

Schroder found in reviewing past research that by using " . . . stimulus situations implying conflict, uncertainty and control in a certain domain" (Schroder, et al., 1968, p. 186) that more construct relevant responses can be produced. For purposes of research

then, it appears to be advantageous if subjects are required to work with a specified stimulus situation in which they must make judgements.

The "general scoring manual" used by Claunch (1964) and Schroder and Phares (1965) for assessing level of conceptual functioning according to theoretically and operationally defined structural variables is represented on a seven point scale. At the present, four gross nodal points have been defined (1,3,5 and 7). Each nodal point represents a level of conceptual functioning (1=low, 7=high). The operationally defined structural variables used by raters to assess level of cognitive-complexity appear in Appendix C.

For the purpose of this study, then, the "general manual" developed by Schroder, et al. (1968) was used to assess level of cognitive-complexity subjects exhibit in writing essays. Each subject wrote an essay type answer in which they made judgements about a specified stimulus domain. The particular domains considered and the rationale for their selection is presented in the procedures section.

Definitions of Theoretical Variables

Cognitive-complexity

Cognitive-complexity is a continuous cognitive variable which is indicative of the manner in which a person construes his social and physical environments.

The more complex a person is the better able he is to differentiate the informational dimensions of a problem, integrate these dimensions in a myriad of ways, and finally, predict the outcomes from the various integrations.

Attitude

"An attitude is the evaluative dimension of a concept . . . the attitude is the sum of beliefs about an object" (Shaw and Wright, 1965, p. 3). Also, "an attitude is defined simply as an organization of interrelated beliefs around a common object" (Rokeach, 1968, p. 116).

Belief

"A belief is any simple proposition, conscious or unconscious, inferred from what a person says or does, capable of being preceeded by the phrase 'I believe that'. A belief is a predisposition to action" (Rokeach, 1968, p. 113).

CHAPTER II

METHOD

Hypotheses

The following general assertion was generated out of the relationship theorized to exist between belief in a social attitude object and the level of cognitive-complexity a person exhibits toward that object.

1. The intensity of belief about a social attitude object is directly related to the level of cognitive-complexity an individual will exhibit with regard to that object. (This relationship is schematized in Figure one).

From this general assertion the following working hypotheses were derived:

H_1:a Individuals reporting high intensity of belief about an attitude object (high-agree and high-disagree on an attitude scale) will be judged of low cognitive-complexity on a task requiring them to deal with that object.

H_1:b Individuals reporting moderate intensity of belief about an attitude object (moderate-agree to moderate-disagree on an attitude scale) will be judged to be of high cognitive-complexity on a task requiring them to deal with that object.

i.e., given attitude domains A and C taken separately, with X=high intensity of belief for, Y=moderate intensity of belief, and Z=high intensity of belief against, then H_0 becomes $p(X>Y)=p(X>Z)=p(Y>Z)=1/2$ with respect to level of complexity exhibited.

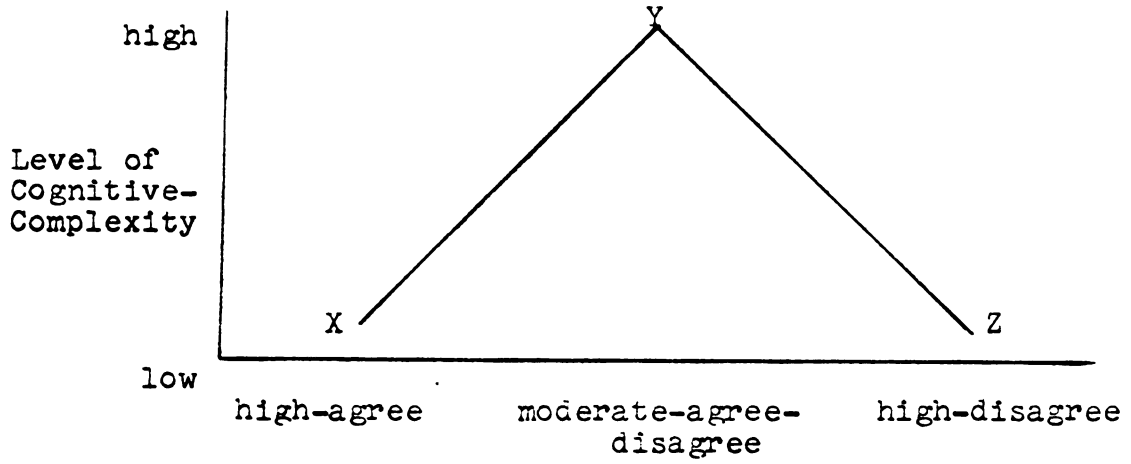

Figure 1. Hypothesized Relationship Between Belief Intensity and Level of Cognitive-Complexity

H_2 Intensity of belief about one attitude object is not significantly correlated with the level of cognitive-complexity exhibited with regard to another social attitude object.

H_3 Intensity of belief about a social attitude object is not significantly correlated with the level of cognitive-complexity on a general measure of that trait.

Also, given the variables of this study where

A = Intensity of belief toward birth control
B = Complexity exhibited toward birth control
C = Intensity of belief toward education
D = Complexity exhibited toward education
E = General complexity

the following correlational relationships are predicted to exist.

$$r_{AB} > r_{AE} > r_{AD}$$

$$r_{CD} > r_{CE} > r_{CB}$$

$$r_{BD} > r_{BE} = r_{DE}$$

Subjects

The sample for this study was drawn from a pool of 270 Michigan State University undergraduates enrolled in an education course entitled "Individual and the School". Seventy-five female subjects were selected from this pool by the method indicated below.

Selection of Subjects

Subjects were selected on the basis of their scores on a birth control attitude scale developed by Wilke (1934). Since a similar distribution was obtained for both sexes, it was decided for practical and analytical purposes to use a homogeneous sample of female subjects only. From the 169 female undergraduates who originally took the attitude scale on birth control, the twenty-five who scored highest and the twenty-five who scored the lowest were selected as being respectively representative of high belief against and high belief for birth control. From the remaining 119 individuals, a third group of twenty-five was chosen at random as being representative of those with moderate intensity of belief toward birth control. Two weeks later, letters were then sent to those students selected asking them to be paid volunteers in the second half of the experiment (Appendix F). In this manner it was possible to eventually obtain a total N=60, twenty subjects being in each group.

Procedure: Attitude Scales

Two attitude scales were used in this study. The birth control scale was developed by Wilke (1934) and is a 22-item Likert type scale scored from one (1=strong agree) to seven (7=strong disagree) with scores that can range from 21 to 147. A high score indicates strong belief in disagreement with birth control, while a low score indicates strong belief in agreement with birth control. This particular attitude scale was chosen because the stimulus domain it reflects appeared to be of such a controversial nature that a wide distribution of scores would be obtained from which to choose subjects. One item on the scale was eliminated (item 6) because it was not relevant to present day concerns regarding birth control. This was ascertained not to affect the validity of the scale (Shaw and Wright, 1967).

The reliability and validity values of the scale are as follows:

1. Reliability: a. split-half = .91
   b. test-retest = .88 to .83
2. Validity: all items have content validity with regard to moral and pragmatic reactions to birth control. Strong face validity (Shaw and Wright, 1968, p. 136).

The birth control scale is reproduced in Appendix A.

The second scale used in this study was one concerning attitudes toward progressive education developed by Kerlinger and Kaya (1959). It is a 20-item Likert type scale and is scored from -3 (strong-disagree) to +3 (strong-agree). Scores can range from -60 to +60. A positive score indicates progressive attitudes toward education, and a negative score indicates traditional attitudes toward education. The reliability and validity of the scale are as follows:

1. Reliability: a. split-half = .83
   b. test-retest = .76

2. Validity: validity estimates considered satisfactory (Shaw and Wright, 1968, p. 84).

The education scale (Appendix B) was included in this study for analytical reasons and its purpose is explained in the section on method validation.

The birth control and education attitude scales were administered together. All items from both scales were randomly mixed with 19 filler items so that the total number of items each subject initially responded to was equal to sixty (Appendix G).

Procedure: Measures of Cognitive-Complexity

Two different assessment techniques were used to ascertain level of cognitive-complexity. One of these was the Barron scale of complexity (Barron, 1967). This scale contains twenty true and false items and is

generally regarded as an overall or general measure of cognitive-complexity. The Barron scale of complexity was administered to all sixty subjects and, like the education scale, was included for analytical purposes (Appendix E). This will be explained in the section on method validation.

The second assessment technique used to ascertain level of cognitive-complexity was that developed by Schroder, et al., (1968). This technique consists of having trained raters use the "general scoring manual of structural variables" (Appendix C) to score essay type responses of subjects dealing with a specified stimulus domain.

The use of this assessment technique required that subjects assume the role of a physician at one time and an educator at another. The task each subject was to perform under these assumed roles was to respond in an "Ann Landers" fashion to a query in letter form from a person seeking advice about a specific topic. Therefore, each subject wrote two letters. The first letter was a response to a woman seeking advice about birth control (Appendix D). The second letter was a response to a woman seeking advice about progressive and traditional education (Appendix D).

To guard against any kind of serial effect from the presentation, half of the subjects received the birth control letter first and the other half the

education letter. Since subjects appeared for the experiment at their convenience, the requirement of randomization was considered met.

Subjects were given 20 to 25 minutes to complete each letter. However, they were instructed to take more time if it was felt to be necessary.

Procedure: Scoring of Content Specific Cognitive-Complexity

In all, 120 essay type answers were collected. Sixty of these dealt with the topic of birth control, and the other sixty dealt with the topic of progressive-traditional education. Each essay was scored by two raters using the "general scoring manual" already described. This manual is reproduced in Appendix C.

As previously explained, although content was important for the purposes of this study, raters were instructed to consider not what the person said, but how he said it. The focus was on structural rather than content variables. As ". . . the major requirement of reliable and valid scoring is a thorough grasp of the theoretical variables describing structural variation and a consideration of each response in these terms" (Schroder, et al., 1968, p. 187), it was necessary to initially train the two raters using simple materials and discussions of the concept of cognitive-complexity in structural terms.

An additional analysis of the essay responses was also performed. Those essays which exceeded more than one and one-half handwritten pages in length, thereby indicating a prolific writer and not necessarily a more cognitively-complex person, were divided in half and reread separately. A split-half reliability coefficient was then computed to ascertain whether length of response influenced rater's scores.

Data Analysis

a. Inter-rater reliability coefficients

An inter-rater reliability coefficient was computed to test the reliability of judgements made by the two trained raters regarding the complexity of the collected essay answers. In addition, a split-halfs reliability coefficient was computed to ascertain whether or not length of a response was an important variable affecting rater's scores as to level of cognitive functioning.

b. Tests of differences between groups

To test for complexity differences between the three groups examined in this study, the Kruskal-Wallis H-Test of variance by ranks was used. (Siegel, 1956, 184-193). This nonparametric technique tests the null hypothesis that k-samples come from the same population under the assumption that the variable under study is part of an underlying continuous distribution.

The Kruskal-Wallis technique was applied to the complexity scores obtained for each of the groups under consideration in this study: a) complexity scores obtained from rater's judgements of essays written by subjects on the topic of birth control (Schroder analytic technique), b) complexity scores obtained from rater's judgements of essays written by subjects on the topic of education (Schroder analytic technique), and c) complexity scores obtained from the administration of the Barron general scale.

Since the Kruskal-Wallis technique does not indicate the direction when a difference is found to exist, it was found necessary to carry out further analysis using the post hoc procedures for the Kruskal-Wallis test (Marascuilo and McSweeney, 1967). To test for differences of significance, the Kruskal-Wallis post hoc procedures contrast the mean ranks of the groups under consideration and indicate direction and magnitude of difference.

c. Method validation

The rationale underlying the multimethod-multitrait matrix for convergent and discriminant validation (Campbell and Fiske, 1959) was seen to be particularly useful in this study for helping to show the validity of the Schroder technique for assessing level of cognitive-complexity. Since concern in this study was

with structural functioning with reference to specified content variables, it was important to show as strongly as possible that the scoring procedure for structural variables was indeed measuring level of cognitive functioning.

In essence, discriminant validation is used for the justification of novel trait measures, for the validation of test interpretation, or for the establishment of construct validity. The rationale underlying the procedure for discriminant validation is that tests can be invalidated by too high correlation with other tests from which they were supposed to differ. The basic requirement of this procedure is that there are at least two different traits to be measured. The two traits considered in this study were: 1) complexity with regard to birth control, and 2) complexity with regard to education.

Convergent validation is confirmation by independent measurement techniques and requires at least two measures of the variable under consideration. This requirement was considered met since there were two measures of cognitive-complexity used in this study (Schroder and Barron).

If the correlation between the two tests is high this is interpreted to mean that both tests are measuring the same variable. However, if the correlation is

low it is necessary to examine the evidence in favor of several alternative propositions: 1) neither method is adequate for measuring the trait, 2) the trait is not a functional unity, the response tendencies involved being specific to the nontrait attributes of each test, or 3) one of the two methods does not measure the trait.

CHAPTER III

RESULTS

Inter-rater Reliabilities

To check the reliability of judgements made by the two raters with respect to the complexity of essays, a Spearman r_s was computed using the two rater's scores on both birth control and education complexity. Table 1 shows the correlations derived from these scores. The correlations indicate an acceptable level of reliability in the raters judgement.

TABLE 1.--Results of the Spearman r_s Test of Correlation Between Rater's Judgements of Complexity.

group*	birth control	education
I	.76	.86
II	.85	.87
III	.87	.81

*Group I = high belief intensity for attitude object
Group II = moderate belief intensity toward attitude object
Group III = high belief intensity against attitude object

Ten of the essays were arbitrarily categorized as being of such a length as to possibly affect the judgement of raters as to the level of complexity exhibited. It was feared that while not being more complex, a prolific writer may be more likely of being judged more complex. The results of a split-halves correlation in which the longer essays (more than a page and one-half in length) within each attitude area were split in two and separately re-judged as to level of cognitive-complexity exhibited are as follows: for birth control essays $r_s = .63$ (N=6), for education essays $r_s = .59$. Correlations were not significant ($p>.01$) which might indicate that length of an essay response may have some influence on rater's judgements of complexity of the response.

Relationship Between Belief and Complexity Scores

Following the Kruskal-Wallis procedure outlined by Siegel (1956, pp. 184-193), complexity scores derived from rater scoring according to the Schroder technique (birth control and education attitude areas) and complexity scores derived from the Barron scale of general complexity were analyzed separately to test for differences between the three groups (each representing a different intensity of belief in the attitude objects under consideration).

Table 2 shows the results of the Kruskal-Wallis H-Test of significance between groups. As expected, complexity scores derived from essays on the topic of birth control show a significant difference ($p<.01$). However, it was not possible to reject the null hypothesis regarding complexity differences between groups of varying intensity of belief as determined on the education attitude scale. Nor was it possible to reject the null hypothesis regarding complexity differences between the three groups in either the birth control or education attitude areas using the Barron scale of general complexity.

TABLE 2.--Results of the Kruskal-Wallis H-Test of the Significance of Differences Between Complexity Scores.

	Complexity		
	birth control	education	Barron
N	20	20	20
degrees of freedom	2	2	2
H	16.84*	5.67	1.71
H corrected for ties	16.97*	5.74	1.72

*denotes significance at $p<.01$.

Table 3 shows the results of a Kruskal-Wallis post hoc analysis done in accordance with the technique outlined by Marascuilo and McSweeny (1967). Using this

technique differences in birth control complexity scores between the three groups of varying belief intensity were identified using the contrast procedure comparing the mean ranks of the groups. As expected, a significant difference was found between the mean ranks of groups one and two ($p<.01$) where group one is high belief intensity for birth control and group two is moderate belief intensity against birth control. A significant relationship was also found between groups two and three ($p<.01$) where group three is high belief against birth control.

TABLE 3.--Results of Kruskal-Wallis Post Hoc Procedure to Test for Significant Differences Between Mean Ranks.

contrast	lower limit	upper limit
$\bar{r}_1 - \bar{r}_2$	-33.57	-19.17*
$\bar{r}_1 - \bar{r}_3$	-10.49	3.89
$\bar{r}_2 - \bar{r}_3$	15.88	30.27*

*denotes significance at $p<.01$.

Since no differences were found between the complexity scores of groups one and three (both high intensity of belief), it was tested whether, as a group, the mean ranks of groups one and three differed from the mean rank of group two (moderate intensity of belief). Table 4 shows the two groups representing high intensity of belief and the one group representing moderate intensity of belief

about birth control differ significantly ($p<.01$) in the level of cognitive-complexity exhibited on the task.

TABLE 4.--Results of Statistical Contrast Between the Two Groups of High Belief Intensity and the One Group of Moderate Intensity.

contrast	lower limit	upper limit
$2\bar{r}_2 - \bar{r}_1 - \bar{r}_3$	47.10	51.80*

*denotes significance at $p<.01$.

Based upon the results stated above, it is possible to reject the null hypothesis concerning the predicted relationship between high intensity of belief about an attitude object (birth control) and a low level of exhibited congnitive-complexity. With respect to the same attitude area, it is also possible to reject the null hypothesis concerning the relationship between moderate belief intensity and high level of exhibited complexity.

However, it was not possible to reject the null hypothesis for the above two relationships based upon the findings relating belief intensity about education and level of exhibited complexity.

As predicted, no significant correlation was found between intensity of belief about one attitude area and the level of exhibited cognitive-complexity with respect to

another attitude area ($p>.01$). It was therefore impossible to reject the null hypothesis of no relationship. The results of the correlational computations are shown in Table 5.

Also, as predicted, it was not possible to reject the null hypothesis of no relationship between belief intensity about a social attitude object and level of complexity as determined by a general measure of that trait ($p>.01$). Table 6 shows the results of the correlational computations.

TABLE 5.--Correlations (Spearman r_s) Between Belief Intensity About One Attitude Area and Level of Exhibited Complexity with Respect to Another Area.

Group	r_{AD}	r_{CB}
I	.415	.350
II	.627*	.413
III	.370	.365

*denotes significance at $p<.01$.

A = Intensity of belief toward birth control
D = Complexity exhibited toward education
C = Intensity of belief toward education
B = Complexity exhibited toward birth control

TABLE 6.--Correlations (Spearman r_s) Between Intensity of Belief in an Attitude Area and Level of Cognitive-Complexity as Assessed by a General Measure of That Trait.

Group	r_{AE}	r_{CE}
I	.348	.162
II	.365	.375
III	.406	.205

A = Intensity of belief toward birth control
E = General complexity
C = Intensity of belief toward education

Instrument Validation

Using the rationale underlying the concepts of discriminant and convergent validation (Campbell and Fiske, 1959), correlations between the variables described below were compared in order to ascertain in part the validity of the instruments used in this study to assess level of cognitive-complexity.

With respect to discriminant validation, it was necessary to show that the correlations found to exist between birth control belief intensity and exhibited complexity (r_{AB}); education belief intensity and exhibited complexity (r_{CD}), should be higher than those found between either birth control or education belief intensity and the level of complexity as measured on the Barron scale (r_{AE} and r_{CE}). These correlations are reported in Tables 7a

and 7b. Except for group three where $r_{CD}<r_{CE}$ (.119<.205), the correlations are higher between AB and CD than they are for, respectively, AE and CE.

To show convergent validation it was considered required that the Schroder technique be able to discriminate among belief levels in more than one attitude domain. The results in Table 2 indicate that the Schroder technique could discriminate among the three levels of belief with respect to the attitude domain of birth control. The discriminative power of the Schroder technique was of such an order as to be significant at $p<.01$. Also, although not significant at $p<.01$, the Schroder technique applied to the attitude domain of education did produce results in the predicted direction and at $p<.10$. In Tables 7a and 7b correlations are shown which indicate the relationships found to exist between belief intensity in one attitude domain and the level of complexity exhibited with respect to another domain (r_{AD} and r_{CB}). Except for group two (r_{AD}) where the relationship between belief intensity in birth control was found to be significantly related to complexity exhibited toward education ($p<.01$), nonsignificant correlations were found. It was concluded from the above evidence that there is reason believe that the Schroder technique does have some validity as a method for assessing levels of cognitive-complexity.

General Relationships

It was predicted that among the variables B (exhibited complexity toward birth control), D (exhibited complexity toward education), and E (Barron complexity) that $r_{BL} > r_{BE} = r_{DE}$. Table 7c shows the correlations found to exist and supports the prediction.

Tables 7a and 7b show the correlations found to exist between the variables AB, AE, AD and CD, CE, CB respectively. It was predicted that AB>AE>AD and CD>CE>CB. However, only in group three in Table 7a AB>AE>AD (.600>.406>.370). In all other areas AB>AE<AD, and CD>CE<CB. These correlations in effect only partially support the original predictions made concerning their relationships.

Attitude Scales

For the purposes of this study, intensity of belief toward an attitude object was defined as the score obtained from an administration of the scale to subjects. Using the attitude scores obtained it was possible to discriminate among three disparate groups representing different intensity levels of belief in the attitude object of birth control. Upon correlating the belief levels between birth control and education (Spearman r_s) it was found that there was no significant relationship between intensity of belief in birth control and intensity of belief in education ($p > .01$). Table 8 shows the results of the correlational computations.

TABLE 7.--Correlational Relationships Between Birth Control Belief, Education Belief, Birth Control Complexity (Schroder), Education Complexity (Schroder) and Barron Complexity (Spearman r_s).

Group	A		
	r_{AB}	r_{AE}	r_{AD}
I	.562*	.348	.415
II	.523	.365	.627*
III	.600*	.406	.370
Group	**B**		
	r_{CD}	r_{CE}	r_{CB}
I	.495	.162	.350
II	.568*	.365	.413
III	.119	.205	.365
Group	**C**		
	r_{BD}	r_{BE}	r_{DE}
I	.750*	.626*	.655*
II	.556*	.414	.522
III	.750*	.555*	.511

*denotes significance at $p<.01$.

A = Intensity of belief toward birth control
B = Complexity exhibited toward birth control
C = Intensity of belief toward education
D = Complexity exhibited toward education
E = General Complexity

TABLE 8.--Correlations Between Scores on the Birth Control Attitude Scale and the Education Attitude Scale (Spearman r_s).

Group	r_{AC}
I	.184
II	.396
III	.315

A = Intensity of belief toward birth control
C = Intensity of belief toward education

CHAPTER IV

DISCUSSION

Belief Intensity and Level of Cognitive-Complexity

The results of this study strongly support the general assertion that there is a direct relationship between intensity of belief in a social attitude object and the level of cognitive-complexity individuals exhibit toward that object. Evidence points to a relationship in which individuals with low belief intensity about an attitude object are better able to deal with that object in more cognitively-complex manner. These individuals see more than one side to a problem and are more willing to consider what could be described as conflicting alternatives.

The evidence also demonstrates that individuals with high belief intensity about an attitude object are more restricted in the kinds of responses they may make in a situation requiring the use of that object. Persons of low complexity appear to be much more categorical and subjective in their judgements and evaluations. They tend to see but one viewpoint and are more likely to defend it exclusively.

For purposes of method validation, two different tests of cognitive-complexity were used in this study. The Schroder technique disclosed a positive significant relationship between belief intensity in birth control and the level of cognitive-complexity exhibited toward that attitude object ($p<.01$). Again using the Schroder technique, a relationship was found to exist between belief intensity in education and level of complexity exhibited ($p<.10$). However, the results from the Barron test of complexity did not statistically lend support to these findings. In the following paragraphs the results of this study are interpreted in terms of the rationale underlying the concepts of convergent and discriminant validation (Campbell and Fiske, 1959).

The procedure followed with respect to discriminant validation is generally used to justify the use of novel trait measures or to establish construct validity. Essentially, a test is considered invalidated if it correlates too highly with a test or tests from which it was supposed to differ. In terms of this study, this was construed to mean that, to be discriminantly valid as a trait measure, the correlations found to exist between birth control belief intensity (A) and exhibited complexity (B); education belief intensity (C) and exhibited complexity (D), should be higher than those found to exist between either birth control or education belief intensity and the level of complexity as measured on a general scale (AE and CE).

The evidence was interpreted to lend support to the validity of the Schroder techniques as a method of assessing level of cognitive-complexity. Except for group three in Table 7b where $r_{CD}<r_{CE}$ (.119<.205), the correlation between intensity of belief in each attitude area the the level of complexity (Schroder) was of a higher magnitude than between belief intensity in each attitude area and general complexity assessed by the Barron technique.

Correlational values for r_{CD} were seen to be of a lower magnitude because subjects were initially selected on the basis of intensity of belief in birth control and did not necessarily fall into an equal distribution between the three groups on the dimension of belief intensity about education.

Even with this being the case, correlations were computed between the two attitude areas with the overall relationship between intensity scores generating a non-significant Spearman r_s (Table 8, $p>.01$). Group two (moderate belief intensity) taken alone did show a significant relationship with $r_s = .396$ ($p<.05$). Although this evidence is weak, it can be interpreted to suggest that more complex individuals are more likely to have attitude domains which intersect each other where there are common or similar stimulus elements.

The procedure for convergent validation requires that there be two different measures of the structural variable under consideration. In this particular instance, the Schroder measure of complexity was used with reference to two specified stimulus domains. It is contended here that, while the general manual of structural variables was the same for the analysis of both attitude areas considered, it can logically be construed as two different tests because the attitude areas were different. Therefore, if it is shown that the Schroder technique can efficiently discriminate between belief levels in more than one attitude domain then the test can be to some extent convergently validated.

A strong significant relationship was found to exist between belief intensity in birth control and the level of complexity exhibited on the required task ($p<.01$). Although not as strong ($p<.10$), a relationship was found also between belief intensity in education and level of complexity exhibited. Also, correlations between belief intensity in one attitude domain and complexity exhibited with respect to the other domain (AD and CB) are nonsignificant except for group two in Table 7a where the correlation between belief intensity about birth control was significantly related to complexity exhibited toward education ($p<.01$).

According to Campbell and Fiske (1959), the low correlations found to exist as noted above can lead to one of three alternative propositions. One of these propositions simply states that perhaps one of the methods used does not measure the trait under investigation. Since it was shown that the Schroder technique was best able to statistically discriminate between levels of cognitive functioning as theoretically defined in this study, and in two separate attitude domains, it is contended that this evidence partially confirms the validity of the Schroder technique for assessing level of cognitive-complexity and suggests that further study be given this area.

In summary, the evidence from this study may be interpreted as supporting the hypothesis of this study that cognitive-complexity is not a general trait and must be assessed with reference to a specified stimulus domain. The use of two theoretically different tests of complexity gave evidence which may be interpreted as favoring the Schroder technique. Evidence also supports the hypothesis that there is a strong relationship between intensity of belief about an attitude object and the level of complexity exhibited toward that object on an essay task.

Assessment of Attitudes and Cognitive-Complexity

Scores obtained from the attitude scales used in this study were seen to be indicative of the intensity of belief that subjects had about the attitude areas under consideration.

By using a highly controversial stimulus domain (birth control) it was possible to select three disparate groups each characteristic of a different intensity level.

A basic problem engendered by the use of such scales is that of all the scales in existence, none is recommended for other than group measures (Shaw and Wright, 1967; Fishbein, 1967) and are therefore of little use in predicting individual attitudes.

Attitude scales represent an abstraction of the attitude construct and all that it implies. An individual generally responds to a scale at a level that is most general, unspecific and inconsiderate of situational variables. Careful and extensive qualifications are not allowed by the very response modes generally used by those who construct the scales.

Consequently, what is obtained from the administration of an attitude scale is a mean abstraction of the attitude construct representing the total group from which the score was derived. This mean score is generally used to generalize to a larger population from which the test sample has been selected and is for the most part quite misleading as to what it actually implies about the population.

The current status of attitude theory, in particular the "school" that views attitudes as learned concepts which are in turn defined as information processing structures (Schroder, et al., 1963) and the measurement

techniques available make this assessment problem essentially one of both measurement and methodology.

The usual measurement techniques such as those developed by Likert (1932); Thurstone (1929); Osgood (1957); and Guttman (1947) stress the use of a unidimensional scale of favorableness-unfavorableness. An individual is typically located somewhere on the continuum with respect to some attitude. The arguement for using unidimensional scales has generally been one of pragmatism (Fishbein, 1967). Aside from the fact that none of the existing attitude scales is recommended for anything but group measures, two prominent problems are raised by the "traditional" approaches to attitude assessment.

The first of these has methodological considerations. That both situational and dispositional factors can vary at any given time makes the usual methods of assessment highly unreliable. For example, a person will not necessarily "act out" a social attitude in a strange crowd as often as he might in the confines of his own home and with friends. It becomes necessary to recognize the difference between kinds of behavior when assessing social attitudes. LaPiere (1934) was among the first to point out that a distinction can and should be made between verbal behavior and actual behavior when studying social attitudes. Himmelstrand (1960) and Green (1954) have since stressed the need for this

distinction. These writers conclude that there is no necessary relationship between the different kinds of behavior. Peer pressures, religious background, or any number of situational or dispositional variables may cause a person to act much differently in a purely symbolic situation (the usual kind of attitude questionnaire) than he would were he actually involved in the hypothetical-general "situation" the attitude questionnaire represents.

Closely connected with the problem of different kinds of behavior is the fact that most individuals answering attitude questionnaires are usually quite aware of the attitude on which they are being tested. Depending on the particular situation, this awareness may indeed bias the responses made. This alone raises the question of whether or not it is ever justifiable to extrapolate from the verbal behavior of respondents to the prediction or "guessing" of their behavior in any situation.

What appears to be necessary is the development of a method which will closely approximate or simulate the situation in which a social attitude might be used. For example, if concern were with the functioning of ethnic biases in teachers then, in order to determine to what extent any individual's actions were based on an ethnic bias, it would be useful to construct a situation which would simulate a classroom activity in which the teacher might engage. In a simulated activity a person would

have the opportunity to directly express behaviorally those attitudinal biases which he or she felt. And, if properly conducted, the person under investigation would not necessarily be aware that the primary purpose of the simulation was to examine the behavioral manifestations of their attitudes.

A possible and seemingly promising approach to the solution of this methodological problem is that offered by the "Teacher's In-Basket" (Shulman, et al., 1968). Essentially, the in-basket is a technique which was developed to study the inquiry behavior of individual teachers-in-training. As in the present study, the subject assumes a role. As a teacher she is placed at a simulated teacher's desk which holds many potential problems in the guise of phone messages, memoranda from faculty, school newsletters, etc. From these materials the subject proceeds to identify problems, or perhaps potential problems and then using the informational resources available to her attempts to work out viable solutions. The various informational materials available concern her new students, access (through an intercom) to a school secretary (an experimenter), a school principal and a "reference memory" (another experimenter). Using these sources the subject, after first identifying a problem, goes about a search for information which will aid in the resolution of the problem.

The subject is isolated in the simulated setting and is observed by two trained scorers through a one-way mirror. As the subject proceeds through the inquiry process she must verbalize at all times what she is thinking. This protocol is recorded for further analysis.

Scorers are responsible for monitoring the manifestations of five variables during the course of the simulation. These five variables are: 1) the number of built in potential problems actually identified and taken up by the subject, 2) the number of "bits" of information used by the subject, 3) the sources of information the subject uses, 4) the level of understanding the subject attains with respect to each problem, and 5) the amount of time the subject gives to inquiry. Scorers are trained to high reliabilities in observing and recording these variables.

It has been found using this approach in the study of inquiry that two basically different groups of inquirers can be identified among teachers-in-training. Interesting enough, these two groups roughly correspond in characteristics with what has been termed in this present study the cognitively-complex and the cognitively-simple. Respectively these were called dialectical and didactic in inquiry style.

It appears that with the necessary adaptations the in-basket technique may offer a unique approach to the

study of attitude manifestations in simulated settings. As with the problem of ethnic biases already discussed, the inclusion of an "ethnic dimension" may result in a different approach to problem resolution by a subject. This in turn may indicate the presence of a bias and suggest experiences which may aid in changing the attitude. In any event, the approach of simulation is closer to actual situations where an attitude might be manifested and is therefore more likely to be reliable in terms of predicting behavior.

Further refinement of simulation techniques appears to be an excellent and perhaps rewarding path to explore for those interested in the assessment of attitude functioning.

Directly allied to the first problem is that of the measurement techniques used in the traditional approaches to attitude assessment. The unidimensional scale is most common and has been criticized by Abelson (1954-1955) as being inadequate to the complexity of measuring attitudinal structures.

As shown above, a more complex assessment of cognitive-functioning is used for the in-basket technique. This is in keeping with a general movement away from the attempt to parsimoniously describe psychological variables as if they were reducible and capable of being so described. Viewed from the theoretical frameworks of

Kelly (1955), Harvey, et al. (1963) and Schroder, et al. (1968), attitudes can be seen as conceptual structures which function through the selection and integration of information from the several informational dimensions usually available to an individual in any given situation.

Cognitively speaking, attitudes can therefore be seen as conceptual structures which range from being very simple to being extremely complex in nature. A simple structure can be characterized as being concrete in nature in that an individual is restricted in his judgements which are based on only a few or one dimension of information. When more than one dimension is used the cognitively-simple person has fewer ways in which to integrate the dimensions. This type of structure might be indicated, for example, if an individual classified persons of the basis of skin color without the consideration of other information.

On the other hand, a complex attitudinal structure can be characterized by judgements which are made using several dimensions of information and integrating them in a manner which best fits the situation at hand. At the complex level the attitudinal structure serves more the function of information searching than simple categorization of that information most prominent.

In addition to the assessment technique used by Schulman, et al. (1968), an additional solution to the measurement problem may be forthcoming in the form of

multidimensional scaling techniques. Although they are only in the developmental stages, they have been useful in situations where no assumptions have been made about the number or nature of the informational dimensions an individual uses in making judgements about some group of stimulus objects. Tucker and Messick (1963) have developed a multidimensional scaling model which allows the dimensions of information an individual uses in making similarity judgements to be described and spatially mapped. A factor analysis of subjects responses permits a determination of dimensional weights thereby giving some indication of the priorities a person uses in making his judgements.

Coupled with a content and process analysis of situational and dispositional variables present in the simulated situation, the multidimensional analysis would offer added information about the cognitive-processes in which individuals engage.

In summary, the current status of attitudinal assessment techniques leads one to search for new methods and ways of measuring which are more relevant and useful to the prediction of behavior. It has been suggested here that the "in-basket" offers a potentially useful method for assessing the functioning of attitudes in simulated settings that approximate conditions where an attitude is likely to be used. It has also been suggested

that closer attention be given to multidimensional scaling techniques for analysis of the informational dimensions persons use in making judgements.

Educational Implications of Study

Teachers are involved in an enterprise which requires them to search for and evaluate an enormous amount of information about their students. This information is derived from both formal and informal sources. They are expected to search for information relevant to the understanding of each student's peculiar needs and capabilities and their relationship to his performance behavior and also to his potential for achievement. This process of selecting relevant information about students and basing decisions upon it is central to the function of teaching.

At times, however, certain highly specific and irrelevant information may play an inordinate role in the judgemental processes of teachers. In the case of a teacher who has an attitudinal bias toward a particular ethnic group or groups, the immediately recognizable characteristic of skin color or another phenotypic mark may serve to put the student into an evaluative category which better serves the needs of the teacher than those of the student. That attitudes function, at least in part, to serve the personality needs of the individual

has been reported by Katz (1960) and Smith, et al. (1956). Representing many contemporary school critics, Schrag (1968) has leveled the charge of both racial and social biases in many teachers.

If it is the case that certain prejudicial biases exist in teachers, whether they be favorable or unfavorable in nature, it follows that they may be potentially or actually harmful to the students of these teachers. What appears desirable at this point is to identify those teachers during their training who harbor such potentially harmful attitudinal biases and to develop experiences that may precipitate attitude change.

It has been known for a long time that attitudes affect the behavior of individual toward attitude objects. This study has shown that the intensity of belief about an attitude object hears some relation to the level of cognitive-complexity an individual will exhibit toward that object. It has also been pointed out that traditional approaches to attitude measurement are useless for the prediction of individual behavior because of instrument limitations.

What is here suggested in the adaptation and experimentation with the "in-basket" technique as a method of assessing attitude manifestation in situations which closely approximate, or simulate situations in which an attitude may be used. As this approach has

been given some use (Shulman, et al. 1968) in an educational setting, it would seem that, as suggested in previous sections, that the inclusion of different informational dimensions which might reflect specific attitudes would give information through the task activities of a subject's biases. Also, it is suggested that attention be given also to multidimensional scaling techniques for gaining extra information about how and in what manner a person integrates informational dimensions in making judgements.

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APPENDICES

APPENDIX A

BIRTH CONTROL SCALE

BIRTH CONTROL SCALE

1. We should be absolutely opposed to birth control.

2. Birth control reduces the marital relation to the level of vice.

3. We ought to approve of birth control because of the advantages to women's health resulting from the correct spacing of children.

4. Uncontrolled reproduction should be opposed on the grounds that it is a fundamental cause of crime.

5. We should not approve of women taking the health risks involved in birth control.

6. The present depression and the attendent problem of unemployment makes more desirable than ever the general approval of birth control.

7. Wide-spread acceptance and approval of birth control is imperative.

8. The practice of birth control is equivalent to murder.

9. Birth control is race suicide.

10. Uncontrolled reproduction should be discouraged since it leads to many social evils.

11. Birth control is a legitimate health measure.

12. Our laws should prohibit giving, even to adults, information concerning birth control.

13. We should not only allow but strongly urge birth control to limit the size of families of low income.

14. Effective measures should be taken to prevent any sale of birth control devices.

15. Birth control would help to solve many of our social problems.

16. Birth control is highly desirable for women who must earn a living.

17. The possible benefits of birth control do not alter the fact that it is morally wrong.

18. Wide-spread knowledge of birth control methods should be opposed as likely to lead to the spread of social disease.

19. We should approve as socially desirable the program of those organizations supporting the movement for birth control.

20. The practice of birth control evades man's duty to propagate the race.

21. Birth control increases the happiness of married life.

22. Every normal healthy couple should have as many children as is physiologically possible.

*These items are against birth control and weights for their response alternatives must be reversed for scoring. The same response categories are used for all items.

APPENDIX B

EDUCATION SCALE

EDUCATION SCALE

1. The goals of education should be dictated by children's interests and needs, as well as by the larger demands of society.

2. No subject is more important than the personalities of the pupils.

3. Schools of today are neglecting the three R's.

4. The pupil-teacher relationship is the relationship between a child who needs direction, guidance, and control and a teacher who is an expert supplying direction, guidance, and control.

5. Teachers, like university professors, should have academic freedom---freedom to teach what they think is right and best.

6. The backbone of the school curriculum is subject matter; activities are useful mainly to facilitate the learning of subject matter.

7. Teachers should encourage pupils to study and criticize our own and other economic systems and practices.

8. The traditional moral standards of our children should not just be accepted; they should be examined and tested in solving the present problems of students.

9. Learning is experimental; the child should be taught to test alternatives before accepting any of them.

10. The curriculum consists of subject matter to be learned and skills to be acquired.

11. The true view of education is so arranging learning that the child gradually builds up a store house of knowledge that he can use in the future.

12. One of the big difficulties with modern schools is that discipline is often sacrificed to the interests of children.

13. The curriculum should contain an orderly arrangement of subjects that represent the best of our cultural heritage.

14. Discipline should be governed by long-range interests and well-established standards.

15. Education and educational institutions must be sources of new social ideas; education must be a social program undergoing continual reconstruction.

16. Right from the very first grade, teachers must teach the child at his own level and not at the level of the grade he is in.

17. Children should be allowed more freedom than they usually get in the execution of learning activities.

18. Children need and should have more supervision and discipline than they usually get.

19. Learning is essentially a process of increasing one's store of information about the various fields of knowledge.

20. In a democracy, teachers should help students understand not only the meaning of democracy but also the meaning of the ideologies of other political systems.

APPENDIX C

SCALE POINTS USED FOR ASSESSING THE CONCEPTUAL LEVEL INVOLVED IN ESSAY WRITING

SCALE POINTS USED FOR ASSESSING THE CONCEPTUAL LEVEL INVOLVED IN ESSAY WRITING*

Scale Point	Description
1	Presents only one side of a problem ignores differences, similarities, and gradations.
2	One side of the problem presented and supported much more fully than the other. Opposing views perceived as compartmentalized or negative. No interrelationships considered.
3	Two or more views clearly differentiated. Similarities and differences implied or presented. One view can be opposed, but it is understood.
4	Includes all involved under scale point 3 but begins to "consider" the similarities and differences between views. At this level, consideration is expressed . . . .as qualifications of each . . . . (for example, "similar, but . . . ."). That is, the simultaneous effects of alternate views becomes apparent in the writer's thinking.
5	Considers alternate and conflicting reasons for perceived similarities and differences between views in producing the essay.
6	Begins to consider relationships, not only among direct similarities and differences between sides of the problem, but also relationships between alternate reasons as to why the differences and similarities occur.

Scale Point	Description
7	The consideration of notions which include relational linkages between alternate views. Such notions are open to all conflicting components and express attempts to see these as parts of a more inclusive "construction" of the problem.

*Taken from Schroder, et al. Human Information Processing, New York: Holt, Rinehart and Winston, Inc., 1968, p. 201.

APPENDIX D

INSTRUCTIONS AND LETTERS FOR TEST OF COGNITIVE-COMPLEXITY

INSTRUCTIONS

This booklet is composed of three parts. Carefully read the instructions for each part before beginning. The times given for completing your answers are not meant to be a constaint. They are only suggestions based on previous tests of this kind. Feel free to take more time if necessary.

PART ONE: completion time 20 to 25 minutes

For the purposes of part one you are asked to assume the role of a prominent physician whose specialty is the study of birth-related problems. Your task is to respond to a letter from a young couple seeking advice about birth control. Respond in an "Ann Landers" fashion giving your advice as a person of knowledge and authority.

If you have any questions please ask them before beginning.

Please turn page and begin.

7 July 1969

S. L. Sulzberg, M.D.
517 National Bldg.
New York Medical Center
New York, New York

Dear Dr. Sulzberg,

My fiance and I are to be married in the very near future and would greatly appreciate some advice from you regarding birth control.

We would like not to have any children right away for both financial and personal reasons. However, we have not been able to decide whether it is acceptable for us in a moral sense to use artificial means for preventing conception. Because of our religious background the decision is quite difficult.

We think it would help us a great deal if you would write giving us some advice as to how you think we should proceed in resolving our dilemma.

Thank you for your time.

Sincerely yours,

Mary Diffel

8341 Eight Mile Rd.
Detroit, Michigan

PART TWO: Completion time 20 to 25 minutes

For the purposes of part two you are asked to assume the role of a prominent educator. Your task is to respond to a letter from a parent concerned with placing her child in a particular school. Respond in an "Ann Landers" fashion giving your advice as an educator of knowledge and authority.

If you have any questions please ask them before beginning.

PLEASE TURN PAGE AND BEGIN.

7 July 1969

Professor H. J. Laurence
School of Education
Harvard University
Cambridge, Mass.

Dear Professor Laurence,

My husband and I are currently in the process of moving to a new city. We have found two houses located in this city which are situated in two different neighborhoods. Both houses are equally acceptable to us.

However, these houses are located in two different school districts and one of the districts is much more progressive and permissive in its attitudes toward education than the other.

The progressive school district feels that learning is experimental and that children should be taught to test alternatives before accepting any of them. They also believe that children should be allowed more freedom than they normally get in the execution of learning activities. The other school district feels that children need and should have more supervision and discipline.

We are unable to decide whether or not it would be better for our child to attend the school located in the more progressive district. Consequently, we would appreciate your advice concerning what we should do about our decision.

Thank you.

Sincerely yours,

Mrs. Howard Greene,

2218 Appel Ct.
E. Lansing, Michigan

APPENDIX E

BARRON SCALE OF COMPLEXITY

PART THREE: Completion time 5 to 10 minutes

Part three is a questionnaire composed of 30 statements which you are asked to agree or disagree. For each statement, respond according to the following key:

(1) TRUE
(2) FALSE

Use the attached IBM score sheet for your responses. BEGIN WITH NUMBER 61.

---

1. I like to have a place for everything and everything in its place.

2. Some of my friends think that my ideas are impractical, if not a bit wild.

3. I don't like to undertake any project unless I have a pretty good idea how it will turn out.

4. For most questions there is just one right answer, once a person is able to get all the facts.

5. Politically I am probably something of a radical.

6. Perfect balance is the essence of all good composition.

7. I prefer to engage in activities from which I can see definite results rather than those from which no tangible or objective results are apparent.

8. I find that a well-ordered mode of life with regular hours is not congenial to my temperament.

9. The unfinished and the imperfect often have greater appeal for me that the completed and the polished.

10. I like to listen to primitive music.

11. I have always had goals and ambitions that were impractical or that seemed impossible for me to realize.

12. When a teacher lectures on something other than what he originally announced, I feel uneasy.

13. Trends toward abstractionism and the distortion of reality have corrupted much art of recent years.

14. It bothers me to have different news commentators give different interpretations of the news.

15. I like to fool around with new ideas, even if they turn out later to have been a total waste of time.

16. I don't like to work on a problem unless there is a possibility of coming out with a clear-cut unambiguous answer.

17. I have always hated regulations.

18. Many of my friends would probably be considered unconventional by other people.

19. It doesn't bother me when things are uncertain and unpredictable.

20. My way of doing things is apt to be misunderstood by others.

21. Facts appeal to me more than ideas.

22. I have had strange and peculiar thoughts.

23. I don't like things to be uncertain and unpredictable.

24. The worst thing an instructor can do is to make very specific plans for each lesson.

25. It is a good rule to accept nothing as certain or proved.

26. I dislike following a set schedule.

27. Usually, I prefer known ways of doing things rather than trying out new ways.

28. I like to go alone to visit new and strange places.

29. I much prefer friends who are pleasant to have around to those who are always involved in some difficult problem.

30. I have had very peculiar and strange experiences.

APPENDIX F

DESCRIPTION OF EXPERIMENT GIVEN TO EDUCATION 200 STUDENTS, SUMMER 1969

TO: Ed. 200 Students, SS'69

FROM: J. Fielder

RE: The following is a brief description of the experiment in which most of you participated either once or twice. If you are interested in a more detailed description or have any questions about the project you want answered, feel free to see me at 401G Erickson Hall.

Regardless of whether it was for altruistic or financial reasons, I greatly appreciate the response of those students who volunteered for the second half of the experiment.

The purpose of this study is to extend the range of convenience of the concept of cognitive-complexity. Generally speaking, the concept of cognitive-complexity is used to indicate the manner in which a person perceives his social world. The cognitively-simple person has been characterized as being rigid, categorical and holding relatively extreme attitudes. When making judgements about any social situation, this person tends to examine only a few dimensions of the problem and rarely seeks additional information. In terms of the research on inquiry done by Shulman, Loupe and Piper (1968), the cognitively simple teacher might be deemed "didactic" in inquiry style.

In contrast, the cognitively-complex person uses more dimensions of information when making judgements, has more ways of integrating the dimensions, and is more abstract. Again in terms of the above mentioned study, the cognitively-complex teacher might be deemed as being "dialectical" inquiry style.

Most studies of cognitive-complexity have tended to search for a unitary trait which affects all of a person's perceptions in the same manner. Recent research has shown, however, that it is unlikely that there is such a unitary trait of cognitive-complexity. One important theoretician (Schroder, 1968) has stated that to assess level of cognitive-complexity, one must direct measurements to the stimulus domain under consideration. His assertion is that cognitive-complexity of teachers in perceiving various ethnic groups

measurements would have to be directed to the specific ethnic group of interest.

The thesis of this study is that the attitude scale offers an efficient, if not potential, way of predicting the complexity of a person's perception toward any social situation. It is theorized that intensity of belief determines one's perception of a social situation. Since an attitude is defined as an organization of beliefs about an attitude object (Rokeach, 1968), it is feasible to hypothesize that scores on an attitude scale will allow us to predict level of cognitive-complexity regarding the stimulus domain the attitude scale represents.

This study is important since we know that teachers may categorize or stereotype students on the basis of an easily recognizable phenotypic characteristic such as skin color. It would be of great value if procedures could be developed which would allow for identification of individual teachers-in-training in which an ethnic bias exist, and most important, affects their judgements about students.

To test the thesis of this study, it is necessary to have subjects who evidence varying degrees of belief intensity on some attitude scale. Therefore, all of the approximately 300 students enrolled in ED. 200 will be initially tested as to intensity of belief about some social attitude object.

On the basis of scores obtained from the attitude scale, approximately 60 subjects will be chosen for further experimentation. There will be three groups each composed of 20 subjects. The first group will be composed of individuals who exhibited a high amount of belief in agreement with the attitude object. The second group will be composed of individuals who exhibited a moderate amount of belief toward the attitude object. And lastly, the third group will be composed of individuals exhibiting a high amount of belief in disagreement with the attitude object.

To test for complexity toward the stimulus domain the attitude object represents, each subject will be asked to perform a task. The task in this instance will be the writing of a letter in an "Ann Landers" fashion in response to a query of the same kind. This letter(s) will reflect the stimulus domain of the attitude scale previously administered.

Results are expected to show that there is a strong relationship between intensity of belief about an attitude

object and the level of cognitive-complexity exhibited by individuals in performing a task requiring them to deal with the stimulus domain the attitude scale represents. If indeed this prediction is correct, future research can be conducted in a manner that will allow for the development of more sophisticated methods of assessing intensity of belief and level of cognitive-complexity toward a myriad of social situations, especially in the classroom.

APPENDIX G

ATTITUDE SCALES AND FILLER ITEMS

USING THE KEY PROVIDED BELOW PLEASE INDICATE YOUR OPINION ON EACH OF THE FOLLOWING STATEMENTS (Numbers 1-60). USE THE ATTACHED ANSWER SHEET TO INDICATE YOUR OPINION.

strong agree (1)	moderate agree (2)	slight agree (3)	slight disagree (4)	moderate disagree (5)	strong disagree (6)

1. The present over population and the attendant problem of unemployment makes more desirable than ever the general approval of birth control.

2. Law controls the conduct of citizens.

3. Practical considerations should come first, beauty second.

4. The possible benefits of birth control do not alter the fact that it is morally wrong.

5. One of the big difficulties with modern schools is that discipline is often sacrificed to the interests of children.

6. Wide-spread acceptance and approval of birth control is imperative.

7. Teachers, like university professors, should have academic freedom.....freedom to teach what they think is right and best.

8. The most effective teaching is by private tutoring.

9. Discipline should be governed by long-range interests and well-established standards.

10. Regardless of sex, there should be equal pay for equal work.

11. The true view of education is so arranging learning that the child gradually builds up a store house of knowledge that he can use in the future.

12. Birth control is a legitimate health measure.

13. We should approve as socially desirable the program of those organizations supporting the movement for birth control.

14. Learning is experimental; the child should be taught to test alternatives before accepting any of them.

15. We should be absolutely opposed to birth control.

16. The practice of birth control is equivalent to murder.

17. We should not approve of women taking the health risks involved in birth control.

18. Most young people are getting too much education.

19. Children need and should have more supervision and discipline than they usually get.

20. Young people should be able to use their leisure time as they please.

21. The traditional moral standards of our children should not just be accepted; they should be examined and tested in solving the present problems of students.

22. The pupil-teacher relationship is the relationship between a child who needs direction, guidance, and control and a teacher who is an expert supplying direction, guidance and control.

23. Effective measures should be taken to prevent any sale of birth control devices.

24. Children should be allowed more freedom than they usually get in the execution of learning activities.

25. The goals of education should be dictated by children's interests and needs, as well as by the larger demands of society.

26. The curriculum consists of subject matter to be learned and skills to be acquired.

27. Birth control reduces the marital relation to the level of vice.

28. Teachers are the molders of society.

29. No subject is more important than the personalities of the students.

30. The practice of birth control evades man's duty to propagate the race.

31. The functioning of law results in the prevention of behavior harmful to others.

32. Every normal healthy couple should have as many children as is physiologically possible.

33. Birth control is race suicide.

34. Most great fortunes are made honestly.

35. One the whole, our economic system is just and wise.

36. A young person should be restricted only when he is infringing upon the rights of others.

37. Schools of today are neglecting the three R's.

38. Birth control would help to solve many of our social problems.

39. Teachers should encourage pupils to study and criticize our own and other economic systems and practices.

40. The backbone of the school curriculum is subject matter; activities are useful mainly to facilitate the learning of subject matter.

41. We should not only allow but strongly urge birth control to limit the size of families of low income.

42. Education in artistic things is a waste of public funds.

43. It is doubtful whether education has improved the world or not.

44. Uncontrolled reproduction should be discouraged since it leads to many social evils.

45. Uncontrolled reproduction should be opposed on the grounds that it is a fundamental cause of crime.

46. Birth control increases the happiness of married life.

47. War is necessary to avoid overpopulation of nations.

48. Our laws should prohibit giving, even to adults, information concerning birth control.

49. International disputes should be settled without war.

50. The curriculum should contain an orderly arrangement of subjects that represent the best of our cultural heritage.

51. We ought to approve of birth control because of the advantages to women's health resulting from the correct spacing of children.

52. Education and educational institutions must be sources of new social ideas; education must be a social program undergoing continual reconstruction.

53. Right from the first grade, teachers must teach the child at his own level and not at the level of the grade he is in.

54. Participation in intensive competition develops leadership.

55. Learning is essentially a process of increasing one's store of information about the various fields of knowledge.

56. Wide-spread knowledge of birth control methods should be opposed as likely to lead to tne spread of social disease.

57. I believe teaching is the most interesting of the professions.

58. In a democracy, teachers should help students understand not only the meaning of democracy but also the meaning of the ideologies of other political systems.

59. Young people should obey their parents because they are their parents.

60. Birth control is highly desirable for women who must earn a living.

PLEASE MAKE CERTAIN YOUR NAME, STUDENT NO., SUMMER CAMPUS ADDRESS, AND SUMMER PHONE NUMBER ARE ON THE ANSWER SHEET.

THANK YOU.

APPENDIX H

LETTER OF SELECTED SUBJECTS

7 July 1969

Dear

On June 30th, you were a participant in the first part of a research project focusing on the teachers-in-training in Education 200. This letter is an invitation to participate as a paid volunteer in the second half of this project.

For one hour of your time, at your convenience, you will be paid $2.00. If you wish to participate, please come at one of the following times and places.

July 14	5 p.m. - 9 p.m.	401 G Erickson Hall
July 15	5 p.m. - 9 p.m.	401 G Erickson Hall
July 16	10 a.m. - 3 p.m.	452 A Erickson Hall
July 17	10 a.m. - 3 p.m.	452 A Erickson Hall
July 18	10 a.m. - 3 p.m.	452 A Erickson Hall

If none of these times are convenient and you wish to participate, please phone me at the number below to make special arrangements.

Again, this project will only require one hour of your time for which you will be compensated. It is important that you participate since this research project deals with the problem of training teachers and cannot be completed without your help.

Thank you.

Sincerely yours,

John F. Fielder,
Project Director

401 G Erickson Hall
353-3798