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APTITUDE TEST PERFORMANCE OF NEGRO COLLEGE STUDENTS AS AFFECTED BY ITEM DIFFICULTY SEQUENCE, ANXIETY REACTION TYPE, AND SEX DIFFERENCES

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

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BY

RALPH B. BUTLER

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1971

APTITUDE TEST PERFORMANCE OF NEGRO COLLEGE STUDENTS AS AFFECTED BY ITEM DIFFICULTY SEQUENCE, ANXIETY REACTION TYPE, AND SEX DIFFERENCES

APPROVED BY

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CHAPTER I

INTRODUCTION

Those working in the field of education and other enterprises employing instruments and techniques of psychological measurement could hardly deny the popularity the field has enjoyed in the past decade. Evidence clearly supporting this contention is the widespread use of tests in business, industry, the military and other government agencies, and, needless to say, in the field of education. Regarding education, further evidence is seen in the fact that many institutions of higher education have partially or completely relinquished their local testing programs to national test bureaus. However, despite the increased popularity of the field it has not been immune to adverse criticism. Paralleling its growth in popularity we have witnessed an increasingly strident criticism of standardized tests. Critics see these measures as bulwarks of bias whose use denies equality of education and job opportunity to Negroes and other minority groups (Manning, 1968, p. 258). To some extent, however, the effects of these criticisms have been beneficial by stimulating among the research community

an increased interest in bringing test methodology into a closer and potentially more productive relationship with educational and psychological theory (Anastasi, 1967). In an effort to further this cause, the present study was embarked upon.

In recent years, the long standing practice in the field of test construction of arranging test items in order of increasing difficulty has been seriously questioned. Sax and Carr (1962, p. 371) observed, that until the last decade no empirical studies have been found to justify such a practice. A further review of the literature confirms this observation. Although many arguments have been made for and against this practice, its continued and widespread use strongly suggest that those arguments supporting it have been widely accepted.

Lund (1953) reports five major arguments supporting the practice of arranging test items in order of increasing difficulty; these are as follows:

1. Difficult items early in the test disrupt the intellectual functioning of the subject.

2. Encountering difficult items early in testing is likely to result in unwise use of time and thereby lower the performance score.

3. The less able subject is unable to cope with the items and will be discouraged.

4. Normal arrangement of items is necessary to encourage naive subjects but sophisticated subjects would not be disconcerted by other arrangements.

5. The overall morale or motivation level of the subjects would be adversely affected by encountering difficult items early in the testing (Lund, 1953, pp. 7-8).

In taking the above arguments as a basis of discussion, argument number 2, i.e., encountering difficult items early in testing is likely to result in unwise use of time, is not one that would be contested vehemently. This is basically a common sense argument. However, it is significant to note, that in any test situation, regardless of the arrangement of test items, there is a chance that certain individuals may be prone to use their time unwisely. For example, the compulsive individual or the very bright subject who might tend to dismiss simple tasks as trivia and thus find solutions to them somewhat frustrating. Also, there is the individual who is not test wise, and regardless of his intellect may fail to discern that test items are arranged in a particular manner.

Although arguments numbers 1, 3, 4 and 5 are not directly related, there appears to be some relationship through the implication of the presence of anxiety as an operating factor. Argument number 1, i.e., difficult items early in the test disrupt the intellectual functioning of the subject, specifically suggests the probable influence of anxiety. This particular argument demands more attention of the writer in that it is one of the major concerns of the present study. The argument strongly suggests that the practice of presenting the more difficult items early in a test will generate some anxiety. Furthermore, it suggests that anxiety serves only to be a disrupting force where intellectual functions are concerned. However, there is evidence that anxiety is not always a disruptive force in the thinking process; in some

cases it may serve as a facilitating factor. Using the Manifest Anxiety Scale, Montague (1953), studying the role of anxiety in serial rote learning, reports that subjects who score high on the scale perform relatively better on simple tasks than those scoring low. Similar findings have been reported by Taylor and Chapman (1955) in investigating paired-associate learning as related to anxiety. However, Farber and Spence (1953), Raymond (1953), and Sinka and Singh (1959) in separate studies investigating the effects of anxiety in performing various mental tasks and using the Taylor Manifest Anxiety Scale, found that on complex tasks subjects who scored high on the scale performed relatively more poorly than those subjects who scored low.

The underlying theory of the Manifest Anxiety Scale is that there is a relatively constant level of internal anxiety or emotionality and the overt or manifest symptoms are measurable (Alpert and Haber, 1960, p. 208). Thus, the Manifest Anxiety Scale is considered to be a measure of general anxiety. Because of this results yielded by the scale have been questioned in view of evidence presented by Child (1954) that anxiety varies within the individual in content and intensity from one situation to another. This would support Mandler and Sarason's (1952, p. 166) contention that instruments measuring anxiety should be composed of items that are relevant to specific situations in question. Obviously there are conflicting views as to the nature of anxiety, how it affects the individual and how it should be measured. The present study proceeds on the assumption that it is a construct

of a specific nature and requires specific instruments in given situations to determine its effect.

The increased concern over the construction of psychological tests, their use, and the increased interest in anxiety have produced several studies in these problem areas. In some instances the two problem areas have been combined and researched. The general purposes of most of the studies falling in this category were to determine the extent to which subjects adapt to test-taking anxiety under differing item difficulty sequencing and/or what order of item difficulty sequencing tend to minimize or eliminate adverse response sets. Although several studies have been conducted in this general problem area, a certain degree of incompatibility appears to exist among findings. Moreover, it may be noted that there is no record of any of these studies being carried out on a sample from an all Negro population.

Although the present study deals with the problem of aptitude performance as affected by item difficulty sequence, test anxiety and sex, its theoretical frame of reference must, out of necessity, be extended to include studies that do not deal directly with all the variables dealt with herein. Thus, for example, Sax and Carr (1962), though not concerned directly with the problem of item difficulty sequencing, demonstrated the superiority of the spiral-omnibus method of arranging test items over the subtest method. The spiral-omnibus method is one in which items measuring a variety of mental operations are combined into a single sequence and from which only a single score is derived

(Remmers, Gage and Rummel, 1960, p. 353). In their study (Sax and Carr, 1962) they administered two forms of the Henmon-Nelson Tests of Mental Ability to 335 freshman college students enrolled in an introductory course in education. Normally this test (Henmon-Nelson) is arranged in the spiral-omnibus form. The researchers left one form of the two forms in its normal arrangement and reorganized the other into separate subtests. In order to reduce practice effects, half of the group was administered the spiral-omnibus form and then the subtest form. For the other half of the group this procedure was reversed. In both cases each subject acted as his own control (Sax and Carr, 1962, p. 372).

The results of the above study revealed that subjects who were administered the spiral-omnibus form attempted more items than those who were administered the subtest form. Additionally, it was revealed that those subjects taking the spiral-omnibus form attained significantly higher scores. Thus, findings indicated the superiority of the spiral-omnibus method over the subtest method of arranging test items. Based on the findings obtained, the following hypothesis was formulated:

> That the presence of increasing complex items in a subtest tends to discourage students from responding to more difficult items, and, conversely, the presence of different types of questions may provide some partial reinforcement and motivation to continue if the subject is able to respond correctly /say/ to a vocabulary item rather than having to face the prospect of additional mathematics items when he has already had difficulty with a number of them (Sax and Carr, 1962, p. 374).

The fact that subjects who were administered the spiral-

omnibus form attempted more items and obtained significantly higher scores than those subjects who were administered the subtest form, led the authors to conclude that response set is dependent upon test format and form of item presentation (Sax and Carr, 1962, p. 375). One should note that this study basically showed the superiority of the spiral-omnibus form over the subtest form and not the superiority of one particular arrangement of items (easy-to-hard, hard-to-easy or random) over the other but it does suggest that the easy-to-hard arrangement is superior.

More directly related to the present study, Lund (1953), who may be considered one of the pioneers in investigating item difficulty sequencing, studied the effects of different item sequences on test performance. In his study the Henmon-Nelson Tests of Mental Ability was used. As indicated earlier, he summarized five major arguments supporting the practice of arranging test items in an easy-to-hard sequence. Based on the findings in his study, he rejected the first four arguments presented, but accepted the fifth, i.e., the overall morale or motivation level of the subjects would be adversely affected by encountering difficult items early in tests. Findings in the study led to the conclusion that the easy-to-hard sequence of test items should continue to be used (Lund, 1953). Similar studies were conducted by Brenner (1964) but led to a different conclusion. In a series of four experiments he investigated the effects of different item difficulty orders but used achievement tests. The item difficulty orders used in the studies revealed no statistically significant

difference between different test item orders. Findings in the studies led to the conclusion "that item difficulty order on power tests of facts and principles given in a normal college classroom will not significantly affect the difficulty level of the test."

Two of the five arguments supporting easy-to-hard arrangement of test items listed by Lund (1953) were investigated by Smouse and Munz (1968). These arguments, in essence, stated (1) that students who receive easier items early in the test would readily adapt to their test-taking anxiety, and (2) that a hard-to-easy sequence would produce lower performance scores due to the disruptive effects of encountering difficult items early in the test. In their study, 113 male and female subjects from two sections of a course in introductory psychology were combined for the administration of the final examination. The combined group was randomly divided into two groups, one a high test-taking anxiety group and the other a normal anxiety group. The high anxiety group was established by the researchers imparting anxiety provoking information to the subjects selected for the group just prior to the test, whereas the normal anxiety group did not receive such information and was placed in a normal test taking atmosphere. The subjects in each group were randomly assigned one of three examination forms, each form differed only in the order of item difficulty (easy-to-hard, hard-to-easy and randomly mixed). Attached at the end of each examination was the Multiple Affect Adjective Check List (MAACL) which measured the amount of anxiety felt in the test situation and was used in that study "to

examine the effects of the three item difficulty sequences on test-taking anxiety" (Smouse and Munz, 1968, p. 182)

Subjecting the data in the above study to a 2 x 3 unequal N analysis of variance revealed no significant differences among the three item difficulty orders. Also, anxiety treatment failed to produce a statistically significant difference. In addition, there was no significant interactive effect of the two variables (anxiety treatments x difficulty orders). Based upon these findings, the following conclusions were drawn by the authors:

> ....the study does not support the hypothesis that there is an item difficulty sequence effect generally operating on the scores of power achievement tests typically found in the classroom. Further, within the limits of the study, it can be concluded that the two major arguments for arranging test items in an easy-to-hard sequence are not valid in any general way (Smouse and Munz, 1968, p. 183).

The two foregoing studies (Brenner, 1964; and Smouse and Munz, 1968) indicate rather clearly that item difficulty orders have little or no effect on test performance where power tests are concerned. A similar conclusion was drawn by Munz and Smouse (1968) in another study. Their investigation was based on 120 students enrolled in four sections of an introductory psychology course taught at the University of Oklahoma. Two independent variables employed consisted of the Achievement Anxiety Test (AAT) and three forms of the final examination, hard-to-easy, easy-to-hard, and random. They concluded that item-difficulty arrangement does significantly affect performance scores but only by interacting with anxiety reactions to test-taking. This, in turn, led the

investigators to conclude that the standard test construction practice of arranging items in an order of increasing difficulty is not justified. The authors suggest that there appears to exist a more complicated relationship between item-difficulty arrangement of test items, specific personality correlates and test performance (see Munz and Smouse, 1968).

Following the design of Munz and Smouse (1968) but using high school seniors, Berger (1968) attempted to clarify inconsistent evidence concerning the effects of item sequencing and extend the findings of Munz and Smouse (1968) to aptitude tests. Berger held the notion that the apparent contradiction between findings might be attributed to (1) the type of tests used (aptitude or achievement) and (2) the type of setting in which the tests were administered, i.e., whether in a field setting (natural test setting) or a laboratory setting (analogous to an experimental situation). In general, the findings of Berger failed to clarify the inconsistencies of evidence concerning the effects of item sequencing and thus led to the following conclusions:

> 1) Item sequencing does not significantly affect the aptitude test performance of high school seniors.
>
> 2) Differential reactions to test-taking anxiety do have a significant effect on aptitude test performance (Berger, 1968, pp. 41-42).

In summary, findings from Sax and Carr's (1962) study comparing the spiral-omnibus form of arranging test items to the subtest form and Lund's (1953) study suggest the continued practice of the traditional arrangement of test items in an easy-to-

hard fashion. On the other hand, similar studies conducted by Brenner (1964), Smouse and Munz (1968) and Berger (1968) failed to produce findings that would justify the retention of such a praetice. With the exception of Brenner's (1964) study, all of the latter mentioned studies dealt with the variable of test-taking anxiety in some way along with item difficulty sequence. Berger (1968) extended his study to include test settings (field and laboratory) along with item difficulty sequence and anxiety reaction type in an attempt to clarify contradictory evidence found in earlier studies.

One indication of the need for the present study is the conspicuous absence of such studies (using Negro samples) from the literature. In view of the highly publicized controversy over the biasedness of standardized tests when used on Negro students, any constructive attempt to shed more light on the subject might be worthy. In spite of the increased interest in test construction and increased interest in investigating anxiety through a variety of activities with many different populations, no one has turned attention to a population of Negro college students. To date, it appears that practically all of the studies examining the effects of item difficulty sequences along with other variables have been restricted to predominately white samples. Without minimizing the importance and need of these studies, the extent to which their findings can be generalized to an all Negro population might be questionable. Thus, the present study employs an all Negro sample, and also examines the sex variable along with item

difficulty sequence and anxiety reaction types.

Regarding the sex variable, it is noteworthy to observe that this variable has not been closely examined in studies of this nature. The writer feels this variable warrants attention in the wake of the matriarchal dominance which exists in a significantly large percentage of Negro families. In conjunction with this, Pettigrew (1964, p. 16) observes that Negro mothers, embittered by their experiences with men, often act to perpetuate the mother-centered pattern in the family by taking a greater interest in their daughters than their sons. He further observes that more Negro females graduate from college than Negro males. This pattern, he surmises, arises from the matriarchal dominance in many Negro families. The pattern is found to be reversed among white Americans.

Similar observations have been made by Vontress (1966). He succinctly states that:

> The Negro woman's suspicion of men reflects itself in the way she brings up her children: the sons can fend for themselves but her daughters must be prepared so they will not go through what she has gone through. Not only does this type of family environment affect marriages among Negroes but it has untold effects on the male child in the educational setting (Vontress, 1966, p. 216).

In addition, Devine (1964) asserts that Negro boys tend to renounce activities defined as feminine: "artistic interests, sensitivity to abstractions, and proficiency in the intellectual activities in the school." He goes on to say, that in most Negro communities anywhere from 60 to 80 percent of the students in honor classes

are likely to be girls.

Social scientific research has made it common knowledge that Negro students, at most academic levels, score consistently lower than whites on most standardized tests measuring intellective factors. There is an abundance of studies in the literature to this effect. One classical example is that of the work of Shuey (1958). This work contains a review of literature comparing Negro and white intelligence extending back and covering a period of some 57 years. Pettigrew (1964) in his book, gives further evidence of the abundance of these particular types of studies. Contained within this work is an evaluative summary of studies comparing measured intelligence of Negroes and whites. Also, Dreger and Miller (1960) give a rather extensive summary of comparative studies between Negroes and whites. Although this work reports studies concerned with other problem areas, the vast majority of it also focuses attention upon studies dealing with intellectual functioning. Thus, the evidence that Negroes do not measure up as compared to whites in their performance on standardized measuring instruments (those measuring variables such as intelligence, aptitude and achievement) appears to be overwhelming. However, it is significant to note, that many of these studies, especially those attempting to support the hypothesis that Negroes are innately inferior intellectually have been found to be inconclusive. The main problems here appear to be the researchers' definition of race and their failure, as social scientist, to follow the scientific models of geneticists in their investigations,

which is for all practical purposes almost impossible (Lopate and Gordon, 1969, p. 2).

Many researchers have shown much interest in comparing the intellectual functioning of Negroes and whites. However, there appears to be a lack of commitment on their part to investigate possible causative factors for the relatively poor performance exemplified by Negroes on standardized tests. Also, there appears to be no strong commitment in examining some aspects of personality in conjunction with scholastic aptitude and academic achievement. There is little doubt for the need of more of the latter such studies. For the measurement of personality variables would likely give a more complete picture of the Negro. It would seem that valid conclusions as to I.Q. score differences between Negroes and whites await this type of research because it has long been suspected that Negroes may incorporate intellectually defeating traits. In connection with this, Clift (1969, p. 95) observes that Negroes can and do develop negative feelings about their personal worth and as a result may come to feel self-hatred. This, he surmises, is inappropriately attributable to race and is not conducive to the realization of the best of their potentialities. In this regard, Vontress (1966) shares a similar view. In looking at the Negro personality, there is one component that is more significant than all others, self-hatred. This component, indeed, precipitates many related difficulties. For when one is a member of a downtrodden reference group, he not only tends to despise his group but also to hate himself for being a

member of the group (Vontress, 1966, p. 211).

Deutsch (1967) has shown that Negro children have significantly more negative self-images than white children. He avers that among the influences converging on the Negro urban child

> is his sensing that the larger society views him as inferior and expects inferior performance from him as evidenced by general denial to him of realistic vertical mobility possibilities. Under these conditions, it is understandable that the Negro child would tend strongly to question his own competencies and in so questioning would be acting largely as others expect him to act, an example is that of a "self-fulfilling prophecy" - the very expectation itself is a cause of its fulfillment (Deutsch, 1967, pp. 106-107).

Accordingly, Dai (1953, p. 546) asserts that being a Negro in America is apt to color practically every act and thought of the Negro child. Persons who are different in anatomical and physiological characteristics cannot help being also different in behavioral and mental traits (Sorokin, 1947, pp. 186-187). Thus, the Negro's self-image is largely a reflection of the actual and legal status he enjoys in the American culture. In accordance, Maltz (1960, p. 12) points out that the minority individual's self-image is affected by the conditions under which he is forced to live, for these conditions prescribe the limits for the accomplishment of any particular goal; they prescribe the "area of the possible."

In view of the arguments and evidence, the idea that among Negroes self-hatred and feelings of hatred toward his own race is highly prevalent is not unreasonable. The question is "how does it come about." The writer maintains that its occurrence

is as typical as developing attitudes of more positive nature. That is, it comes about through the development of the self which Mead (1934) contends arises through the individual's interaction with and reaction to other members of society--his peers, his parents, his teachers and other institutional representatives. Through identification and as a requisite for effective communication, he also maintains, the child learns to assume the role of others with whom he interacts and also their attitudes, thus assumed, condition his response to others' and to his own behavior. Further, Mead suggests that the collection of attitudes of the others with whom the individual interacts is organized in the "generalized other": that community which gives the individual his unity of self. To the extent that the individual is a member of this community, its attitudes are his, its values are his, and its norms are his, and his image of himself is structured in these terms. Each self, although having its unique characteristics of personality, is also an individual reflection of the social process (Mead, 1934). Holding a similar view, Cooley (1956, p. 184) has said that the self might be considered a looking glass, since one's self-idea has three principal components: "The imagination of our appearance to the other person; the imagination of his judgement of that appearance; and some sort of self-feeling, such as pride or mortification."

Accepting the above notions as to the development of self, what can be said about the development of self for the Negro youth in white America? The generalized other whose

attitudes the Negro child assumes and the looking glass into which he gazes, although different media, reflects the same judgement: because of his dark skin, he is inferior. The youth learns these attitudes not only from some representatives of the white community, but also from his family and peers who have been socialized to believe that they are sub-standard human being. Thus, their behavior is acted out accordingly although not necessarily at the conscious level.

The self of the Negro youth, developed in the lowest stratum of a color caste system, is shaped, defined, and evaluated by a generalized other that does not look too favorably upon highly visible skin color. The Negro person's self almost naturally becomes a negatively esteemed one which is nurtured through contact with such institutionalized symbols of caste inferiority as segregated schools (de facto or de jure), neighborhoods, and jobs and more indirect negative indicators such as reactions of his own family. Gradually becoming aware of the meaning of his dark skin, the Negro child comes to see himself as an object of scorn and disparagement, unworthy of love and affection, and he learns to despise himself. From that time on, his personality and style of interaction with his environment become molded and shaped in a warped, self-hating manner.

In search of established psychological theory that is consistent with the present line of discussion, one finds that Karen Horney's theory appears quite applicable. Horney (Jersild 1955, p. 30) advances the notion that there is a kind of basic

anxiety linked to a child's helplessness when he has to deal with a world that is hostile, unjust, and unaccepting and with an environment that blocks the free use of his energies and hinders his efforts to be himself. As a result of this, the child develops certain strategies in an effort to cope with his own inner response to threats that are visited upon him from the external world. These strategies may take three major directions (1) moving toward people, (2) moving away from people, and (3) moving against people (Hall and Lindzey, 1957, p. 133). Moving toward people essentially means compliance, conformity, self-effacement and appeasement. Moving away from people is manifested in withdrawal behavior, a tendency to remain aloof and detached. Moving against people would be exemplified in aggressive, expansive, and competitive behavior (Jersild, 1955, pp. 31-32).

If Horney's theory holds true in the generic sense, then one facing hard reality can view the Negro child as having a multiplicity of obstacles to overcome in an effort to adjust favorably in this society. For he can literally be considered as entering into a hostile, unjust, and unaccepting environment.

Looking more closely at the personality of Negro youth, but in a relatively narrow scope, Clift (1969) reports that, characteristically, one would expect to find:

> 1) That they show anxiety at having to work in two systems of values. In their culture certain actions or ways of living are accepted, but are rejected by the world of school, possibly leading to confusion and hostility toward one or both the systems of values.

2) That they respond primarily with anxiety to any threatening situation and may attempt to solve problems by repeated withdrawal.

3) That they possess massive anxiety and confusion resulting in the inability to maintain one kind of activity or reaction (Clift, 1969, pp. 96-97).

These are only a few of the relatively adverse characteristics that are seemingly an outgrowth of the Negro youth's culture. Armed with the knowledge that Negro and white children, generally, grow up in two distinctly different cultures, one would reason that there would be distinctly different personality and cognitive styles formed as a result. That this is possibly true has been demonstrated by Feld and Lewis (1967). These investigators administered the Test Anxiety Scale to an entire second grade population of a large school system in the eastern part of the United States. The results of the study revealed that Negro children had substantially higher anxiety scores on all four sub-scales along with the total scale. Administering scholastic aptitude tests to older Negro students, Cameron (1968, p. 252) indicates that he frequently observes considerable anxiety in these students complicated by fears of failure. He suggests that we should move toward the goal of finding predictors more valid than aptitude scores alone, or variables which when combined with aptitude scores that will result in a better predictor of classroom performance. While several of the observations and studies cited involved Negro children and youths, it is safe to say the same tendencies and dispositions found among them are also found among Negro adults.

Over the years, certain factions of the Negro community have waged harsh criticism against psychological tests in terms of yielding an adequate psychological appraisal of Negro students. In capsule the word is "bias," or in other words the content of the test is not relevant to the experiences of the Negro population. Despite this long-standing criticism, it seems that psychological tests have become an integral part of the American way of life, and are thus here to stay, at least for a while. In the future, as in the past, the use of psychological tests will likely play a major role in the selection and placement of Negro college students, and also in their educational guidance. Thus, for the most part, the Negro college student must be judged by the same measuring instruments as his white counterpart. It is not in the realm of the present study to evaluate the fairness of this practice, but it is in its realm to seek out reasons for substandard performance by Negroes on standardized tests and ways to bring about improvements in their performance.

Statement of the Problem

In considering the foregoing discussion, it should be recognized that the major impetus for the present study is the apparent lack of empirical information on the effects of such variables as item difficulty sequence, test-taking behavior, and sex, when studied simultaneously, upon test performance of Negro college students. From the same discussion, it should also be recognized that it is the belief of the writer that cultural

influences affect Negro students in many adverse ways. Personality development may be cited as one aspect of the Negro that may be adversely affected by his culture. Needless to say, personality has a far reaching effect for most individuals in dealing with human affairs. However, narrowing the scope and focusing upon the Negro's personality when he is placed in situations which demand the use of intellectual ability, may result in any positive efforts on his part being negated by the influence of personality, more specifically anxiety reactions in this instance.

The problem of the present study is stated in the following question: What effects do item difficulty sequences, anxiety reaction types, and sex differences have upon scholastic aptitude test performance of Negro college students.

More specifically, the study seeks to ascertain if different item difficulty arrangements of test items, i.e., increasing order of difficulty, decreasing order of difficulty and random order of difficulty along with differential reactions to test taking anxiety, and sex differences, will produce significant effects upon verbal and quantitative scholastic aptitude test performance of Negro college students.

Hypotheses to be Tested

The following hypotheses are stated in such a manner so as to encompass both verbal and quantitative aptitude test scores although separate analysis of variances were run on each set of scores. In accordance with the problem of the present study, it

is hypothesized that:

Hypothesis 1. There will be a statistically significant interaction between the variables of item difficulty sequence and anxiety reaction type, and thus this will produce an effect on verbal and quantitative aptitude test performance, respectively.

Hypothesis 2. There will be a statistically significant interaction between the variables of item difficulty sequence and sex, and thus this will produce an effect on verbal and quantitative aptitude test performance, respectively.

Hypothesis 2A. Among males there will be no statistically significant differences between item difficulty sequences on verbal and quantitative aptitude test performance, respectively.

Hypothesis 2B. Among females there will be statistically significant differences between item difficulty sequences on verbal and quantitative aptitude test performance, respectively.

Hypothesis 3. There will be a statistically significant interaction between the variables of anxiety reaction type and sex, and thus this will produce an effect on verbal and quantitative aptitude test performance, respectively.

Hypothesis 3A. Among males there will be a statistically significant difference between anxiety reaction types on verbal and quantitative aptitude test performance, respectively.

Hypothesis 3B. Among females there will be a statistically significant difference between anxiety reaction types on verbal and quantitative aptitude test performance, respectively.

Hypothesis 4. There will be statistically significant

interaction between the variables of item difficulty sequence, anxiety reaction type and sex, and thus this will produce some effects on verbal and quantitative aptitude test performance, respectively.

Hypothesis 4A. There will be a statistically significant interaction between item difficulty sequence and anxiety reaction type for males on verbal and quantitiative aptitude test performance, respectively.

Hypothesis 4B. There will be a statistically significant interaction between item difficulty sequence and anxiety reaction type for females on verbal and quantitiative aptitude test performance, respectively.

The Hypotheses 2, 2A, 2B, 3, 3A, and 3B were not derived from any theoretical or statistical basis. They were exploratory in nature and formulated for the purpose of seeking information.

Significance of Study

The present study should have particular significance for colleges, such as the one from which the sample was selected, that have their own local testing programs and employ the use of standardized tests to determine whether a student is to advance from one level to the other in his field of study. In many Negro colleges where such programs do exist there has been a high rate of failure, with a consequent delay for the student in advancing in his chosen field of study. Findings of this study might have use as a basis on which colleges in the sampled population could

re-examine their testing programs and possibly institute some means of identifying those students who experience failure on conventional tests due to test-taking anxiety. As a result, the college might include in its testing program comparable but less conventional tests that would minimize the influence of anxiety in test-taking.

CHAPTER II

METHOD

Subjects

In the present study 300 Negro advanced college sophomore students were used as subjects; 150 were males and 150 were females. The subjects were randomly selected from 948 third quarter sophomore students enrolled at a predominately Negro college located in middle Tennessee during the school year of 1970-71. Third quarter sophomores are those students who have completed at least 80 quarter hours. Information as to the names and addresses of those students comprising the population was provided by the Office of Admissions and Records of the college involved. The random selection of subjects was achieved by drawing with replacement. Each student was arbitrarily assigned a number from 1-948. The numbers were placed in a container and withdrawn and replaced, one at a time, until a sample 300 was reached.

The subjects selected constituted a little less than 33% of the population. This percentage was decided upon because it was believed to be capable of yielding a good representative sample. Furthermore, the design of the study called for a reduction of the original sample size (N = 300). An N of 300 was believed to be sufficiently large enough to absorb an approximate

48% reduction without greatly diminishing representativeness of the population. The need for the reduction of the original size may be explained as follows: First of all, only extreme anxiety types were treated in the analysis. Six subgroups (n = 50) were formed based on results from three forms of the Henmon-Nelson Tests of Mental Ability (College Edition) and sex. Two anxiety types were determined in each of the six subgroups based on ranked difference scores of the Achievement Anxiety Test. Those subjects who ranked in the approximate top 25% (n = 13) and the approximate bottom 25% (n = 13) on the anxiety test in each subgroup were the only ones included in the final analysis. The subjects falling in the approximate middle 50% range of each subgroup were discarded thus resulting in a reduction of the original sample N of 300 to an N of 156.

Because of the likelihood that some students would fail to complete all experimental treatments, 400 students were tested to insure that the desired number of 300 would be obtained. As expected, some students did not complete all experimental treatments and thus were discarded. As indicated earlier, some of the 300 subjects selected to participate in the experiment were not used because of the nature of the design. The 156 subjects that were used in the final analysis were considered to be representative of the population under investigation. These students represented a wide variety of major fields which are embraced by the Colleges of Agriculture and Home Economics, Arts and Sciences, Education, and Engineering. However, they were not selected on a

proportionate basis in terms of major fields.

Instruments

Two instruments were used for the purpose of collecting data in the present study. These were (1) The Achievement Anxiety Test and (2) The Henmon-Nelson Tests of Mental Ability (College Edition). The Achievement Anxiety Test was selected because it was the only one available by which measures of facilitating anxiety and debilitating anxiety in test-taking situations could be obtained. In the selection of the Henmon-Nelson Test two points of consideration were made, these were (1) that its manual explicitly stated its order of item difficulty, i.e., increasing in order of difficulty, one which was needed for the study and (2) that the test has been used in some earlier studies similar to the present study. The later consideration was made for the purpose of keeping the instrument consistent with that of earlier studies.

The Achievement Anxiety Test (from this point referred to as the AAT) was constructed by Alpert and Haber (1960) to measure the reported effects of anxiety experienced in test taking situations. The test is comprised of two scales, a facilitating scale which consists of nine items and a debilitating scale consisting of ten items. Each type of anxiety is measured by a separate subtest of items. The two scales are administered in one questionnaire. The test-retest reliabilities for a 10 week interval were reported to be .83 and .87, respectively. Over an

8 month period the test-retest reliability was reported to be .75 for the facilitating scale and .76 for the debilitating scale (Alpert and Haber, 1960).

The Henmon-Nelson Tests of Mental Ability (Nelson, Lamke, and Kelso, 1961) are designed to measure those aspects of mental ability which are important for success in academic work and in similar endeavors outside the classroom. The test consists of four levels covering a range from grade three through the first year of graduate school. There are two forms of the test, A and B, which are similar in construction and difficulty. The college edition which was used in the present study contains 100 items arranged in order of increasing difficulty. The test yields three scores: (1) quantitative (Q), (2) verbal (V), and (3) a total score. The total score is obtained by adding the quantitative and verbal scores. Reported from Buros (1965), the odd-even reliabilities, based on 100 cases, are .92 and .89 for Q, .92 and .93 for V, and .95 and .94 for the total score on Forms A and B, respectively. With an approximate 35 day interval, the reliabilities reported for alternate forms on the Q scale is .84, for the V scale .88, and .89 for the total score. Regarding validity, correlations with freshman first semester grade point average based on a sample of 95 college freshmen, are reported to range from .46 to .54 across all three scores.

The normal time limit on the Henmon-Nelson Test (College Edition) is 40 minutes. In the present study the time limit was extended to 55 minutes. This was done to assure that the subjects

would have sufficient time to complete the test.

The published arrangement of items on the Henmon-Nelson Test is in the order of increasing difficulty (easy-to-hard). This arrangement was one of the three item difficulty sequences used in the study and was coded as E-H. The other two item difficulty sequences were in a decreasing order of difficulty (hard-to-easy), coded as H-E and randomly mixed, coded as R. The latter two sequences H-E and R were constructed by cutting items from the original test and then arranging them in the order desired. The H-E sequence was merely reversed from the E-H sequence. Item arrangements on the R sequence was accomplished by the use of a table of random numbers. In each case the items were taped on a blank sheet of 8½" by 11" paper; these were photocopied and then run on a multilith press. All items on each form of the test were identical, differing only in their arrangements as indicated.

Procedure

The AAT was administered to the participating subjects approximately three weeks prior to the administration of the Henmon-Nelson Tests of Mental Ability (College Edition). In administering the AAT, special precaution was taken in an effort to minimize the effects of motivation by assuring the subjects that the results of the test would be used for research purposes only. This precaution was taken in view of the findings in a study by Davids (1955) that results on anxiety scales can be influenced by the subject's motivation.

The AAT, as indicated earlier, yields a facilitating (AAT+) score and a debilitating (AAT-) score. Each of these scores were determined for each subject. A difference score was then derived by subtracting his AAT- score from his AAT+ score. A positive difference score would be indicative of a relatively high AAT+, whereas a negative difference score would be indicative of a relatively high AAT-. Those subjects obtaining an AAT+ score would be assumed to have their performance on tests enhanced by their anxiety while those obtaining an AAT- would be assumed to have their performance depressed. The hand scoring process was employed to obtain all AAT scores.

Regarding the administration of the Henmon-Nelson Test, its true identity was not revealed to the subjects. The test was administered under the title of The Academic Progress Inventory. Limited testing facilities and the need to avoid conflict with regular classes at the college necessitated scheduling four test sessions to collect data on the Henmon-Nelson Test. A fifth session was scheduled as a makeup session for those subjects who failed to make one of the other four. At the beginning of each test session, male subjects were instructed to be seated on one side of the room while female subjects were instructed to be seated on the other. This was done in an effort to assure that among each sex group, assignment of each test form would be approximately equal. As indicated earlier, there were three different forms of the test (three item difficulty sequences). The items on all three forms were identical and differed only in terms

of their arrangements, E-H, H-E and R.

Following the seating of the subjects, they were informed that the test "is one currently being considered as a replacement for the present sophomore examinations." Passing the sophomore examinations which consist of the Cooperative English Tests and the Sequential Tests of Educational Progress is one of the requirements that must be met by each sophomore student enrolled at the college involved in the study before advancing to upper division courses in his respective major field. The reason stated for the possible change was that The Academic Progress Inventory (Henmon-Nelson) is less time-consuming and can possibly do as well or better in evaluating their academic progress. The subjects were also informed that those individuals whose scores fall at or above the group's 50 percentile will be exempted from taking the sophomore examinations (permission for this adjustment was granted by the college involved). This was done in an effort to create a natural test setting atmosphere. The tests were then distributed at random to each group. Instructions for the test were read aloud by the examiner while the subjects read them silently. Particular emphasis was given to those parts of the instructions that read to "answer all questions in consecutive order and not to skip around, and to answer all questions, if possible, in the time allowed."

Subsequent to the collection of data, the answer sheets were grouped into their respective item sequence (E-H, H-E and R) for the purpose of scoring. Scoring on this particular test was

accomplished by an electronic scoring machine. Two scores were obtained for each student, namely verbal and quantitative. Before the next step was initiated, a check was made to see if all scores were in their proper grouping. Following this procedure, test scores were classified on the basis of sex within each item sequence; at this juncture, six subgroups had been formed with 50 subjects in each. Next, a difference score obtained from the AAT for each subject was matched with his or her verbal and quantitative aptitude test scores. The AAT difference scores in each subgroup were ranked. The top 13 subjects in their respective subgroups were operationally designated as facilitators while the bottom 13 subjects were operationally designated as debilitators. This further classification doubled the number of subgroups from six to 12. The remaining subjects from each distribution of scores were discarded from the final analysis.

As indicated above, the last breakdown (facilitators and debilitators) resulted in 12 subgroups in the present study; each subgroup was made up of 13 cases (n = 13). The total number of subjects in the final analysis was 156. The subgroups may specifically be described as follows: (1) male facilitators on easy-to-hard sequence, (2) male debilitators on easy-to-hard sequence, (3) female facilitators on easy-to-hard sequence, (4) female debilitators on easy-to-hard sequence, (5) male facilitators on hard-to-easy sequence, (6) male debilitators on hard-to-easy sequence, (7) female facilitators on hard-to-easy sequence, (8) female debilitators on hard-to-easy sequence, (9) male facilitators

on random sequence, (l) male debilitators on random sequence, (ll) female facilitators on random sequence, and (l2) female debilitators on random sequence. Figure 1 illustrates these descriptions in abbreviated form.

The statistical method employed for analyzing the data in the present study was that of analysis of variance. More specifically, it was a factorial analysis of variance which is a statistical method that "analyzes the independent and interactive effects of two or more independent variables on a dependent variable" (Kerlinger, 1964, p. 213). Two analyses of variances were run, one on the verbal scores and one on quantitative scores of the Henmon-Nelson Test (College Edition). In both instances the independent variables were item difficulty sequence, anxiety reaction type and sex; whereas the dependent or criterion variable was the resulting performance of each subject on the respective scales, verbal and quantitative. The data were subjected to a 3 x 2 x 2 analysis of variance (3 item difficulty sequences by 2 anxiety reaction types by 2 sexes). The level of significance was set at .05. In cases where there were significant findings, the Newman Keuls method was employed in an effort to probe the nature of the differences between treatment totals (Winer, 1962, p. 80).

	Facilitators (B_1)		Debilitators (B_2)	
	Males (C_1)	Females (C_2)	Males (C_1)	Females (C_2)
E-H Sequence A_1	$A_1B_1C_1$	$A_1B_1C_2$	$A_1B_2C_1$	$A_1B_2C_2$
H-E Sequence A_2	$A_2B_1C_1$	$A_2B_1C_2$	$A_2B_2C_1$	$A_2B_2C_2$
R Sequence A_3	$A_3B_1C_1$	$A_3B_1C_2$	$A_3B_2C_1$	$A_3B_2C_2$

Figure 1. 3 x 2 x 2 Analysis of Variance Design.

CHAPTER III

RESULTS

Two sets of data for 156 subjects were analyzed separately in the present study. One set was verbal and the other was quantitative, and both were obtained on the Henmon-Nelson Tests of Mental Ability (College Edition). F_{max} tests for homogeneity of variance were performed on both verbal and quantitative data, respectively. The resulting F_{max} value of 7.60 on the verbal data was not significant ($p > .01$). Neither was the F_{max} value of 3.59 on the quantitative data significant ($p > .05$). The results of these tests allowed the application of the ensuing analysis of variance without violating the basic assumption of homogeneity of variance.

Table 1 summarizes the analysis of variance results for verbal scores, whereas Table 2 gives a summary of the analysis of variance results for quantitative scores. On the analysis of verbal data (Table 1) no statistically significant differences among the three item difficulty sequences, A main effect, ($F = 1.47$, $df = 2/144$, $p > .05$) were revealed, nor was there a statistically significant difference between sexes, C main effect, ($F = .002$, $df = 1/144$, $p > .05$). However, there was a statistically significant difference between anxiety types (facilitators and

Table 1

Analysis of Variance Summary Table for Verbal Data

Source of Variation	df	MS	F	P
A (Item Sequence)	2	81.97	1.47	NS*
B (Anxiety Type)	1	251.31	4.51	.05
C (Sex)	1	.11	.002	NS
A x B	2	3.82	.07	NS
A x C	2	257.70	4.63	.05
A for C_1	2	24.50	.44	NS
A for C_2	2	315.17	5.66	.01
B x C	1	7.41	.13	NS
B for C_1	1	172.51	3.10	NS
B for C_2	1	86.21	1.55	NS
A x B X C	2	296.58	5.33	.01
AB for C_1	2	140.48	2.52	NS
AB for C_2	2	159.93	2.87	NS
Error	144	55.68	-	-
Total	155	-	-	-

*NS = not significant at the .05 level

Table 2

Analysis of Variance Summary Table for Quantitative Data

Source of Variation	df	MS	F	P
A (Item Sequence)	2	3.01	.11	NS*
B (Anxiety Type)	1	84.78	3.13	NS
C (Sex)	1	60.32	2.23	NS
A x B	2	0.00642	0.00024	NS
A x C	2	41.23	1.52	NS
A for C_1	2	24.15	.89	NS
A for C_2	2	20.09	.74	NS
B x C	1	48.51	1.79	NS
B for C_1	1	130.78	4.83	.05
B for C_2	1	2.51	.09	NS
A x B x C	2	45.76	1.69	NS
AB for C_1	2	22.52	.83	NS
AB for C_2	2	23.24	.86	NS
Error	144	27.09	-	-
Total	155	-	-	-

*NS = not significant at the .05 level

debilitators), B main effect, on verbal performance scores ($F = 4.51$, $df = 1/144$, $p < .05$). In applying the Newman-Keuls Test to the verbal data (Table 3), it was revealed that facilitators scored significantly higher than debilitators ($p < .05$). Analysis of quantitative data (Table 2) revealed no statistically significant differences among the three item difficulty sequences, A main effect, ($F = .11$, $df = 2/144$, $p > .05$) or between the anxiety reaction types (facilitators and debilitators), B main effect ($F = 3.13$, $df = 1/144$, $p > .05$). Nor was there a significant difference found between sexes, C main effect ($F = 2.23$, $df = 1/144$, $p > .05$).

In the present study it was hypothesized that:

Hypothesis 1. There will be a statistically significant interaction between the variables of item difficulty sequence and anxiety reaction type, and thus this will produce an effect on verbal and quantitative aptitude test performance, respectively. Analysis of verbal data (Table 1) revealed no statistically significant A x B interaction ($F = .07$, $df = 2/144$, $p > .05$), nor was the A x B interaction on quantitative data (Table 2) statistically significant ($F = .00024$, $df = 2/144$, $p > .05$), thus the hypothesis was not supported.

Hypothesis 2. There will be a statistically significant interaction between the variables of item difficulty sequence and sex, and thus this will produce an effect on verbal and quantitative aptitude test performance, respectively. Analysis of verbal data (Table 1) revealed statistically significant A x C interaction

Table 3

Newman-Keuls Test on all Ordered Pairs of

Totals for B Main Effect

(Verbal Data)

Order		1	2
Treatment Totals		1631 (Debilitators)	1829 (Facilitators)
1	1631	-	198*
2	1829		-
Truncated range r			2
q.95 (r,144)			2.77
q.95 (r,144) $\sqrt{nMS_{error}}$***			181.66

* = significant at the .05 level

***n=78; MS_{error}=55.68

($F = 4.63$, $df = 2/144$, $p < .05$), however, on the analysis of quantitative data (Table 2) A x C interaction was not statistically significant ($F = 1.52$, $df = 2/144$, $p > .05$). In view of these findings, the verbal A x C interaction hypothesis was supported but the quantitative was not. A probe with the Newman-Keuls Test (Table 4) on verbal data, revealed that females who took the hard-to-easy sequence performed significantly better than females taking the easy-to-hard sequence ($p < .05$).

Hypothesis 2A. Among males there will be no statistically significant differences between item difficulty sequences on verbal and quantitative aptitude test performance, respectively. Analysis of verbal data (Table 1), A for C_1, revealed no statistically significant simple main effect ($F = .44$, $df = 2/144$, $p > .05$), nor did analysis of quantitative data (Table 2), A for C_1, reveal a statistically significant simple main effect ($F = .89$, $df = 2/144$, $p > .05$). In view of these findings this hypothesis was supported.

Hypothesis 2B. Among females, there will be statistically significant differences between item difficulty sequences on verbal and quantitative aptitude test performance, respectively. Analysis of verbal data (Table 1), A for C_2, revealed a statistically significant simple main effect ($F = 5.66$, $df = 2/144$, $p < .01$). Analysis of quantitative data (Table 2), A for C_2, revealed no statistically significant simple main effect ($F = .74$, $df = 2/144$, $p > .05$). The findings support the A for C_2 hypothesis on the verbal data but failed to support the A for C_2 hypothesis

Table 4

Newman-Keuls Test on all Ordered Pairs of Totals for AxC Interaction (Verbal Data)

Order		1	2	3	4	5	6
Treatment Totals		480 (E-H,F)	553 (H-E,M)	572 (R,M)	593 (R,F)	603 (E-H,M)	659 (H-E,F)
1	480	-	73	92	113	123	179*
2	553		-	99	40	50	106
3	572			-	21	31	87
4	593				-	10	66
5	603					-	56
6	659						-
Truncated range r ...			2	3	4	5	6
q.95 (r,144)			2.77	3.31	3.63	3.86	4.03
q.95 (r,144) $\sqrt{nMS_{error}}$***			105.26	125.78	137.94	146.68	153.14

* = significant at the .05 level
*** = n=26; MS_{error}=55.68
E-H = Easy-to-Hard
H-E = Hard-to-Easy
R = Random
F = Female
M = Male

on quantitative data. Probing with the Newman-Keuls Test (Table 5) on verbal data, revealed that females who took the hard-to-easy sequence performed significantly better than females taking the easy-to-hard sequence ($p < .01$). Also, it was shown that females who took the random sequence performed significantly better than those taking the easy-to-hard sequence ($p < .05$).

Hypothesis 3. There will be a statistically significant interaction between the variables of anxiety reaction type and sex, and thus this will produce an effect on verbal and quantitative aptitude test performance, respectively. In this instance, neither the B x C interaction for verbal data in Table 1 ($F = .13$, $df = 1/144$, $p > .05$) or the B x C interaction for quantitative data in Table 2 ($F = 1.79$, $df = 1/144$, $p > .05$) were significant. Thus, this hypothesis was not supported.

Hypothesis 3A. Among males there will be a statistically significant difference between anxiety reaction types on verbal and quantitative aptitude test performance, respectively. Analysis of verbal data (Table 1), B for C_1, revealed no statistically significant simple main effect ($F = 3.10$, $df = 1/144$, $p > .05$), however, analysis of quantitative data (Table 2), B for C_1, did reveal a statistically significant simple main effect ($F = 4.83$, $df = 1/144$, $p < .05$). Findings, in this instance, failed to support the verbal part of the hypothesis but did support the quantitative part. Probing with the Newman-Keuls Test (Table 6) on quantitative data, revealed that male facilitators performed significantly better than male debilitators ($p < .05$).

Table 5

Newman-Keuls Test on all Ordered Pairs of Totals for A For C_2 Simple Main Effect

(Verbal Data)

Order		1	2	3
Treatment Totals		480 (E-H)	593 (R)	659 (H-E)
1	480	-	113*	179**
2	593		-	66
3	659			-
Truncated range r			2	3
q.95 (r,144)			2.77	3.31
q.95 (r,144) $\sqrt{nMS_{error}}$***..			105.26	125.78
q.99 (r,144)			3.64	4.12
q.99 (r,144) $\sqrt{nMS_{error}}$			138.32	156.56

* = significant at the .05 level
** = significant at the .01 level
***n=26; MS_{error}=55.68

Table 6

Newman-Keuls Test on all Ordered Pairs of

Totals for B For C_1 Simple Main Effect

(Quantitative Data)

Order		1	2
Treatment Totals		404 (Debilitators)	505 (Facilitators)
1	404	-	101*
2	505		-
Truncated range r			2
$\ddot{q}.95\ (r,144)$			2.77
$q.95\ (r,144)\sqrt{nMS_{error}}$*** ...			90.02

* = significant at the .05 level

***n = 39; MS_{error}=27.09

Hypothesis 3B. Among females there will be a statistically significant difference between anxiety reaction types on verbal and quantitative aptitude test performance, respectively. Statistical significance was not found on the analysis of verbal data (Table 1), B for C_2, ($F = 1.55$, $df = 1/144$, $p > .05$) or on the analysis of quantitative data (Table 2), B for C_2, ($F = .09$, $df = 1/144$, $p > .05$). Thus, findings failed to support either part of this hypothesis.

Hypothesis 4. There will be statistically significant interaction between the variables of item difficulty sequence, anxiety reaction type and sex, and thus this will produce some effects on verbal and quantitative aptitude test performance, respectively. Analysis of verbal data (Table 1) did reveal statistically significant second order interaction, A x B x C, ($F = 5.33$, $df = 2/144$, $p < .01$), however, no statistically significant second order interaction, A x B x C, occurred on the analysis of quantitative data in Table 2 ($F = 1.69$, $df = 2/144$, $p > .05$). Findings, in this instance, supported the verbal part of the hypothesis but failed to support the quantitative part. A probe with the Newman-Keuls Test (Table 7) on verbal data, revealed that female facilitators on the hard-to-easy sequence scored significantly better than female facilitators on the easy-to-hard sequence ($p < .01$). Also, it was revealed that female facilitators on the hard-to-easy sequence performed significantly better than male debilitators on the random sequence ($p < .05$) and female debilitators on the easy-to-hard sequence ($p < .05$). Further examination of the matrix

TABLE 7

NEWMAN-KEULS TEST ON ALL ORDERED PAIRS OF TOTALS FOR A x B x C INTERACTION

(VERBAL DATA)

Order...		1	2	3	4	5	6	7	8	9	10	11
Treatment Totals....		227 ($A_1B_1C_2$)	251 ($A_3B_2C_1$)	253 ($A_1B_2C_2$)	261 ($A_2B_1C_1$)	263 ($A_1B_2C_1$)	280 ($A_2B_2C_2$)	292 ($A_2B_2C_1$) ($A_3B_2C_1$)	301 ($A_3B_1C_2$)	321 ($A_3B_1C_1$)	340 ($A_1B_1C_1$)	379 ($A_2B_1C_2$)
1	227	-	24	26	34	36	53	65	74	94	113	152**
2	251		-	2	10	12	29	41	50	70	78	128*
3	253			-	8	10	27	39	48	68	87	126*
4	261				-	2	19	31	40	60	79	118
5	263					-	17	29	38	58	77	116
6	280						-	12	21	41	60	99
7	292							-	9	29	48	87
8	301								-	20	39	78
9	321									-	19	58
10	340										-	39
11	379											-
Truncated range r...			2	3	4	5	6	7	8	9	10	11
$q.95(r,144)$...			2.77	3.31	3.63	3.86	4.03	4.17	4.29	4.39	4.47	4.55
$q.95(r,144)\sqrt{nMS_{error}}$***			74.51	89.04	97.65	103.83	108.41	112.17	115.40	118.09	120.24	122.40
$q.99(r,144)$.....			3.64	4.12	4.40	4.60	4.76	4.88	4.99	5.08	5.16	5.23
$q.99(r,144)\sqrt{nMS_{error}}$			97.92	110.83	118.36	123.74	128.04	131.27	134.23	136.65	138.80	140.69

*=significant at the .05 level

**=significant at the .01 level

***n=13; MS_{error}=55.68

formed through the Newman-Keuls Test revealed no statistically significant differences between other factors.

Hypothesis 4A. There will be a statistically significant interaction between item difficulty sequence and anxiety reaction type for males on verbal and quantitative aptitude test performance, respectively. No statistically significant simple interaction was found on either the verbal data (Table 1), AB for C_1, ($F = 2.52$, $df = 2/144$, $p > .05$) or the quantitative data (Table 2), AB for C_1, ($F = .83$, $df = 2/144$, $p > .05$). Findings failed to support either part of this hypothesis.

Hypothesis 4B. There will be a statistically significant interaction between item difficulty sequence and anxiety reaction type for females on verbal and quantitative aptitude test performance, respectively. No statistically significant simple interaction was found on either the verbal data (Table 1), AB for C_2, ($F = 2.87$, $df = 2/144$, $p > .05$) or the quantitative data (Table 2), AB for C_2, ($F = .86$, $df = 2/144$, $p > .05$). The findings here failed to support either part of this hypothesis.

CHAPTER IV

DISCUSSION

The present study is an attempt to demonstrate empirically the effect of item difficulty sequence, anxeity reaction to test-taking and sex differences upon verbal and quantitative aptitude test performance of Negro college students. It was not a comparative study in the sense of comparing Negroes directly with whites, for as indicated, an all Negro sample from a predominately Negro college was used. However, it should be remembered that the basic justification for the study was that earlier studies of this nature have been conducted using samples comprised, for the most part, of white subjects. In this regard, there is some question as to the extent to which the findings of earlier studies could be generalized to an all Negro population in view of the apparent differences in the cultural background of Negroes and whites.

Tables 1 and 2 summarize the analysis of variance results for verbal and quantitative data, respectively. An inspection of both tables (1 and 2) reveals no statistically significant A main effect (item sequence) for verbal or quantitative data. This may serve to refute arguments favoring tests with items arranged in an increasing order of difficulty and suggest that the

retention of this practice is of little value, if any at all. The findings support those of Brenner (1964), Smouse and Munz (1968), and Berger (1968) who failed to produce findings in their studies that would justify the retention of such a practice. On the other hand, the findings do not support those of Lund (1953) who concluded from findings in his study that the practice of arranging test items in an increasing order of difficulty should be continued. This conclusion was based on the findings supporting his contention that the overall morale or motivation level of the subjects would be adversely affected by encountering difficult items early in tests.

For verbal data, separating the sexes and testing for simple main effects revealed no statistically significant differences among males (A for C_1). This gives further evidence of the lack of value found in arranging test items in an easy-to-hard sequence. Testing for simple main effects among females (A for C_2), significance was found at the .01 level. It was revealed here that female subjects who took the hard-to-easy sequence performed significantly better than those taking the other two sequences (E-H and R). This finding is contrary to the prevailing notion of the superiority of tests with their item difficulty occurring in an easy-to-hard fashion. An inspection of cells on the verbal data (Table 8) shows that this effect appears to be due entirely to female facilitators. Separating the sexes on quantitative data (Table 2) and testing for simple main effects revealed no statistically significant differences among

males or females (A for C_1 and A for C_2), respectively. Thus, these findings run counter to arguments favoring tests with increasing order of difficulty and further suggest that item difficulty sequence produces no effect on test performance.

Although not hypothesized, but as expected on the basis of previous research, a statistically significant difference was found between facilitators and debilitators (the B main effect) at the .05 level on the verbal data (Table 1). This would lend support to the idea that anxiety is not always a disruptive force in thinking and problem solving; in some instances it may serve as a facilitating agent. In other words, in test situations anxiety may function as a variable that enhances test performance and also as one that may depress test performance depending upon the reactions of those taking the test. Although the B main effect was significant, when the sexes were separated and tests were run for simple main effects, B for C_1 and B for C_2, no significance occurred on either. This suggests that the pooling of all facilitators disregarding sex and the pooling of all debilitators disregarding sex, in the case of B main effect, accounted for the significant difference that occurred. The effect that was present on pooled data apparently diminished when the sexes were separated. This would indicate that the relationship, though significant (B main Effect), was too small to have practical value.

Table 1 (verbal data) revealed no statistically significent C main effect (sex). Little can be said about this

occurrence except that although differences may have existed, they were not sufficient enough to produce an effect on the dependent variable. This would indicate that the two sex groups were quite similar in their performance on the verbal portion of the test.

For the verbal data, an inspection of Table 1 shows significant first order interaction occurring between item difficulty sequence and sex (A x C), $p < .05$. The table also reveals no significant main effects for variables A and C, respectively. Thus, in and of themselves neither item difficulty sequences nor sexes differed significantly but taken together the two variables did interact and produced an effect on the dependent variable. Under A x C interaction, A for C_1 and A for C_2 simple main effects failed to yield significant differences. This would serve to support the nonsignificance found for A main effect. Table 2 (quantitative data) reveals no significant A x C interaction. This would indicate that these two variables failed to combine effectively or to act jointly to produce an effect on the dependent variable. Unlike A and C variables on the verbal data, the A and C variables on quantitative data appear to be relatively independent of each other.

As seen in Table 1 (verbal data) A x C interaction was significant at the .05 level, however, with the introduction of B variable (anxiety type) for second order interaction, A x B x C, the results were significant at the .01. From this, one would surmise that the increased significance was attributed to the introduction of the B variable. Reviewing each main effect in

Table 1, it can be seen that the variables A (item sequence) and C (Sex) in and of themselves did not differ significantly and thus produced no effects. However, B (Anxiety type) did differ significantly ($p < .05$). Taken together, i.e., A, B, and C there occurred a significant effect upon the dependent variable of verbal aptitude test performance.

In cases where there were significant findings a probe with the Newman-Keuls Test revealed that female subjects on the H-E sequence performed significantly better than other groups on the E-H and R sequences. This finding was contrary to expectation. However, post hoc reflection upon this phenomenon convinces the writer that it should not be so surprising. The explanation may lie in the expectation of the subject when he discerns what direction the item difficulty sequence is taking. Psychologically speaking, if one discerns early in the test that it is to become decreasingly less difficulty, then it may be reasonable to assume that his motivational level may be increased. This increase in motivation may likely occur while working on the more difficult items thus yielding better performance on them and subsequently easier items. In other words, the increase in the subjects' motivational level would be attributed to their expectation that as the test progresses it will become less difficult. The theory here would be assumed to be applicable to the more perceptive subject. And, in this instance, it appears that female subjects were the more perceptive. These findings are consistent with the beliefs held by Pettigrew (1964) and Vontress (1966) discussed in Chapter I

regarding the likelihood of Negro females excelling in the area of academics over Negro males because more care and interest are given them by their mothers.

In comparing both verbal and quantitative analysis of variance results, it appears that verbal aptitude test performance tended to be more affected by the independent variables than quantitative aptitude test performance. One possible reason for this is that quantitative principles and theorems as compared to verbal material are more fixed or less ambiguous in meaning. This possibly would make quantitative measures less apt to be affected by such variables as the order of test items, anxiety reactions, and sex differences. Other possible explanations may lie in the trend taken by the data itself. The F_{max} test that was performed on the verbal data did reflect a departure from homogeneity of variance. This probably could have operated as an influencing factor upon the results. However, the departure was not considered serious and any influence this might have had on the results would likely to have been negligible in view of the robustness of the analysis of variance statistic. The F_{max} test performed on the quantitative data clearly indicated that the assumption of homogeneity of variance was met on the different groups involved. Another assumption underlying analysis of variance is whether or not the data for each of the cells are normally distributed. In an effort to get a quick estimate of this, a frequency polygon was constructed for each of the 12 subgroups on both verbal and quantitative data. Most of the polygons did reflect some skewness occurring in the

distributions which might possibly have accounted for some of the differences found among groups, especially on the verbal data. But again, this is not likely in view of the above mentioned robustness.

Although the present study did not produce many significant findings, some value is derived from the fact that, in general, it supports the findings of other studies using non-Negro samples. Specifically, the results of this study provided additional evidence that item difficulty sequencing does not significantly affect aptitude test performance and that different anxiety reactions in test-taking situations do have a significant effect upon aptitude test performance. Thus, the results of the present study in which an all Negro sample was used serve to complement the results of earlier studies conducted by Brenner (1964), Smouse and Munz (1968), and Berger (1968) in which the samples were comprised mostly of white subjects. Inasmuch that it is generally believed that there are differences in the cultural backgrounds of Negro and white children, we now have additional information on the effects of item difficulty sequencing and anxiety reaction types upon aptitude test performance.

In an effort to interpret the findings in the present study caution has been exercised since they may be due to the group studied and the college setting. Also, conclusions should be restricted to the group under investigation until further evidence is obtained on similar groups in comparable institutions.

CHAPTER V

SUMMARY AND CONCLUSIONS

The present study was conducted in an effort to determine the effects of item difficulty sequence, anxiety reaction type, and sex differences upon aptitude test performance of Negro subjects. More specifically, the investigator attempted to ascertain if different item difficulty arrangements of test items when combined with different anxiety reaction types and controlled for sex differences would produce significant effects upon verbal and quantitative aptitude test performance of Negro college students.

Three hundred, third quarter, sophomore students, 150 males and 150 females, attending a predominately Negro college in middle Tennessee during the school year of 1970-71 served as subjects in the study. These subjects were randomly selected from a class of 948 advanced sophomores. The Achievement Anxiety Test (AAT) and the Henmon-Nelson Tests of Mental Ability (College Edition) were administered to determine anxiety reactions and aptitude (verbal and quantitative), respectively. The Henmon-Nelson Test is designed to measure verbal, quantitative, and total aptitude. Only verbal and quantitative scores were treated in the present study. The test was arranged in three orders of item difficulty thus yielding three forms. The item difficulty orders were

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3 x 2 x 2 analysis of variance (3 item difficulty sequences by 2 anxiety reaction types by 2 sexes). In cases where there were significant findings, the Newman-Keuls Test was applied in an effort to probe the nature of the differences between treatment totals.

The analysis of verbal aptitude data produced one significant main effect---that of anxiety types (facilitators and debilitators). Two statistically significant interactions occurred, one was between the variables item difficulty sequence and sex (A x C), and the other between item difficulty sequence, anxiety reaction type and sex (A x B x C). The analysis of quantitative aptitude data produced no significant main effects or interaction.

Based on the findings in the present study, the following conclusions were drawn:

1. Neither verbal or quantitative aptitude test performance are affected by item difficulty sequencing.

2. Verbal aptitude test performance is affected by anxiety reaction types but quantitative aptitude test performance is not.

3. Sex differences in and of themselves produce no effects upon verbal or quantitative aptitude test performance.

4. Item difficulty sequence and sex will interact and produce an effect on verbal aptitude test performance but will not affect quantitative aptitude test performance.

5. Item difficulty sequence, anxiety reaction type, and sex will interact and produce an effect on verbal aptitude

performance but will not affect quantitative aptitude test performance.

These conclusions should be restricted to the group under investigation until further evidence is obtained on similar groups in comparable institutions.

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APPENDICES

APPENDIX A

The AAT

Please print:

Name_____

Birthdate_____

Sex_____

Instructions:

Indicate the degree to which each item applies to you by circling the desired number. If, in the following example, you do not like animals at all then you would circle the #1. If you liked animals very much, then you would circle #5. The numbers between 1 and 5 represent different degrees of how you feel about liking animals.

for example: I like animals.

1 2 3 (4) 5

Not at all ——— Very much

1. Nervousness while taking an exam or test hinders me from doing well.

5 4 3 2 1

Always ——— Never

2. I work most effectively under pressure, as when the task is very important.

5 4 3 2 1

Always ——— Never

3. In a course where I have been doing poorly, my fear of a bad grade cuts down my efficiency.

1 2 3 4 5

Never ——— Always

4. When I am poorly prepared for an exam or test, I get upset, and do less well than even my restricted knowledge should allow.

1 2 3 4 5

This never happens to me ——— **This practically always happens**

5. The more important the examination, the less well I seem to do.

5 4 3 2 1

Always ... Never

6. While I may (or may not) be nervous before taking an exam, once I start, I seem to forget to be nervous.

5 4 3 2 1

I always forget ... I am always nervous during an exam

7. During exams or tests, I block on questions to which I know the answers, even though I might remember them as soon as the exam is over.

5 4 3 2 1

This always happens to me ... I never block on questions to which I know the answers

8. Nervousness while taking a test helps me do better.

1 2 3 4 5

It never helps ... It often helps

9. When I start a test, nothing is able to distract me.

5 4 3 2 1

This is always true of me ... This is not true of me

10. In courses in which the total grade is based mainly on one exam, I seem to do better than other people.

1 2 3 4 5

Never ... Almost always

11. I find that my mind goes blank at the beginning of an exam, and it takes me a few minutes before I can function.

5 4 3 2 1

I almost always blank out at first ... I never blank out at first

12. I look forward to exams.

1 2 3 4 5

Never ... Always

13. I am so tired from worrying about an exam, that I find I almost don't care how well I do by the time I start the test.

1	2	3	4	5
I never feel this way				I almost always feel this way

14. Time pressure on an exam causes me to do worse than the rest of the group under similar conditions.

5	4	3	2	1
Time pressure always seems to make me do worse on an exam than others				Time pressure never seems to make me do worse on an exam than others

15. Although "cramming" under pre-examination tension is not effective for most people, I find that if the need arises, I can learn material immediately before an exam, even under considerable pressure, and successfully retain it to use on the exam.

5	4	3	2	1
I am always able to use the "crammed" material successfully				I am never able to use the "crammed" material successfully

16. I enjoy taking a difficult exam more than an easy one.

5	4	3	2	1
Always				Never

17. I find myself reading exam questions without understanding them and I must go back over them so that they will make sense.

1	2	3	4	5
Never				Almost always

18. The more important the exam or test, the better I seem to do.

5	4	3	2	1
This is true of me				This is not true of me

19. When I don't do well on a difficult item at the beginning of an exam, it tends to upset me so that I block on even easy questions later on.

1	2	3	4	5
This never happens to me				This almost always happens to me

APPENDIX B

Aptitude Test

E-H Form

The Academic Progress Inventory

FORM EH

DIRECTIONS TO STUDENTS

Do not turn this page until directed to do so.

No marks of any kind are to be made on this test booklet. Answers are to be marked on a separate answer sheet, where there is also room for any rough figuring you may need to do.

Please be sure to observe the following rules:

Use the special pencil in marking all answers.

Make sure each mark is heavy and black. Mark only one answer for each question. If you change an answer, erase the first mark completely. Then mark your corrected choice.

As you work on the test, keep your place on the answer sheet. Make certain that the answer you are marking is numbered the same as the item you are answering.

Make sure that you attempt to answer each question even if you are not sure of the answer.

It is very important that you answer each question in turn and do not skip around. Thus, you should answer each question before you go on to the next question. Once you have finished answering the questions on one page you may go on to the next--but remember to answer every question.

The three practice exercises below are given so that you may see how to do the test.

Practice 1.

Oak is a kind of:

(1) wood (2) stone (3) metal (4) glass (5) liquid

Which word tells what **oak** is? Yes, **wood** is the answer. This answer has been correctly marked for you on the answer sheet.

Practice 2.

1, 2, 3, 4, 5, ..., ... What two numbers should come next?

(1) 1 and 2 (2) 9 and 1 (3) 10 and 7 (4) 22 and 20 (5) 6 and 7

On your answer sheet, mark the answer you think is correct. You should have marked response number 5 for practice question 2, since the answer (5) is correct.

Practice 3.

Scales are to fish as wool is to:

(1) cotton (2) sheep (3) birds (4) silk (5) lakes

What is the number of the best answer? Mark the response space numbered the same as the answer you think is correct. You should have marked number 2 for practice question 3, since **scales** are to **fish** as **wool** is to **sheep.**

You will have 55 minutes to work on this test. This should be sufficient time to finish all the questions if you work rapidly. Remember that you should answer each question before you move on to the next question.

Do not begin work until you are told to do so.

1. **A person of integrity is:**
   (1) upright (2) neutral (3) prejudiced (4) ungainly (5) profound

2. **To delude is to:**
   (1) mislead (2) carry away (3) bring (4) seek (5) demand

3. **If a silver kopek is warth 40¢, how many kopeks can one buy for $216?**
   (1) 540 (2) 360 (3) 864 (4) 5400 (5) 3600

4. **6 ,12, . . . , 27, 36, 46. What number should appear in the blank?**
   (1) 18 (2) 19 (3) 24 (4) 15 (5) 14

5. **Acute means:**
   (1) permeable (2) mighty (3) morose (4) inadequate (5) keen

6. **To diverge is to:**
   (1) come together (2) amuse (3) branch off (4) plant (5) agree

7. **19, 16, 14, 11, 9, 6, . . , . . . What two numbers should come next?**
   (1) 3 and 0 (2) 3 and 1 (3) 4 and 1 (4) 8 and 11 (5) 5 and 2

8. **Conservative is the opposite of:**
   (1) vigilant (2) liberal (3) reserved (4) inherent (5) discriminative

9. **A stripling is a:**
   (1) voter (2) highlander (3) tribesman (4) youth (5) vassal

10. **An ingenious person is:**
    (1) vehement (2) stately (3) noble (4) sinless (5) inventive

11. **A synopsis is a:**
    (1) nerve part (2) disease (3) refutation (4) condensation (5) preface

12. ***Vigilant* is the opposite of:**
    (1) negligent (2) tactful (3) pungent (4) typical (5) rampant

13. **1, 2, 4, 8, 16, 32, . . , . . What two numbers should come next?**
    (1) 36 and 40 (2) 58 and 59 (3) 33 and 34 (4) 48 and 64 (5) 64 and 128

14. **Revoke is to cancel as elude is to:**
    (1) refer (2) embark (3) await (4) evade (5) exalt

15. **An azure sky is:**
    (1) clouded (2) threatening (3) reddish (4) starry (5) blue

16. **Arabian is to horse as Bengal is to:**
    (1) tiger (2) sheep (3) Arabia (4) vegetable (5) Africa

17. **The sum of two numbers is 5; their product is 0. What are the two numbers?**
    (1) 2½ and 2½ (2) 2 and 3 (3) 0 and 5 (4) 5 and 10 (5) ½ and 5½

18. **If the square of six less the square of four is an odd number divisible by 5, indicate the third answer; if not, indicate the fifth answer.**

19. **If the sum of the squares of the successive odd numbers from 1 to 5 inclusive is less than seven times six, indicate the second answer; if more, indicate the third answer.**

20. **Meticulous is to slovenly as turbulent is to:**
    (1) noisy (2) awesome (3) desirable (4) peaceful (5) vacillating

Go on to the next page.

21. To blight is to:
(1) shine (2) disappear (3) ruin (4) compress (5) ignore

22. House residence President United White of called States the of the the the is If these words were arranged to make a good sentence, what would be the first letter of the second word in the sentence?
(1) H (2) p (3) o (4) r (5) t

23. 93, 82, ..., 63, 55, 48. What number should appear in the blank?
(1) 71 (2) 70 (3) 74 (4) 75 (5) 72

24. An eccentric person is:
(1) dishonest (2) thrifty (3) skeptical (4) peculiar (5) foolish

25. Oblivion is a state of:
(1) worry (2) fear (3) poverty (4) forgetfulness (5) thanksgiving

26. Reimburse is to embezzle as regurgitate is to:
(1) steal (2) swallow (3) specify (4) count (5) revivify

27. Premeditation involves:
(1) sleeping (2) curing (3) planning (4) looking back (5) hesitation

28. To metamorphose is to:
(1) leap (2) see (3) occupy (4) liken (5) change

29. If eight is less than nine but more than six, indicate the fifth answer; if less than nine and less than six, indicate the fourth answer.

30. 9, 18, 15, 30, 27, . . . , ... What two numbers should come next?
(1) 24 and 21 (2) 64 and 61 (3) 54 and 108 (4) 54 and 51 (5) 36 and 33

31. 9, 10, 5, 6, 3, 4, . . . , . . What two numbers should come next?
(1) 3 and 4 (2) 1 and 2 (3) 2 and 3 (4) 8 and 9 (5) 5 and 2

32. Ponderous means:
(1) concise (2) impotent (3) unconscious (4) weighty (5) mischievous

33. 3, 18, 6, 36, 12, . . . , . . What two numbers should come next?
(1) 72 and 9 (2) 72 and 26 (3) 72 and 36 (4) 72 and 24 (5) 72 and 432

34. 13, 19, . . , 34, 43, . . . What two numbers should appear in the blanks?
(1) 25 and 52 (2) 28 and 49 (3) 24 and 33 (4) 26 and 53 (5) 25 and 53

35. A bulwark is a:
(1) marker (2) fortification (3) monument (4) scaffold (5) guidepost

36. 1, 4, 9, 16, 25, 36, . . , . . What two numbers should come next?
(1) 48 and 61 (2) 49 and 64 (3) 39 and 54 (4) 41 and 46 (5) 49 and 65

37. A supercilious person is:
(1) monstrous (2) illicit (3) humble (4) miserly (5) arrogant

38. Sodden means:
(1) upturned (2) grassy (3) worthless (4) leaden (5) soaked

39. To be apathetic is to be:
(1) enthused (2) informed (3) ignorant (4) indifferent (5) sincere

40. What per cent of $400 is 4% of $500?
(1) 16⅔% (2) 5% (3) 10% (4) 2½% (5) 8%

41. If three plus five is greater than seven and less than nine, indicate the fifth answer unless six is greater than five, in which case indicate the first answer.

42. Base is to noble as lewd is to:
(1) noisy (2) think (3) coarse (4) chaste (5) sensitive

43. 1529, 1478, 1427, 1376, 1325, . . What number should come next?
(1) 1274 (2) 1275 (3) 1254 (4) 1225 (5) 1224

44. ⅝ are how many thirds?
(1) 3 (2) 3⅗ (3) 2½ (4) 2⅕ (5) 1⅛

45. Diamond is to jewel as gold is to:
(1) ring (2) silver (3) element (4) mine (5) plentiful

46. Resuscitate is to revivify as copy is to:
(1) imitate (2) originate (3) model (4) prepare (5) serve

47. A bauble is a:
(1) mistake (2) model (3) cup (4) trinket (5) shawl

48. A seismograph records:
(1) music (2) blood pressure (3) writing (4) speed (5) quakes

49. 11, 7, 10, 12, 24, 20, 23, 25, . . The next number should be:
(1) 21 (2) 50 (3) 28 (4) 27 (5) 5

50. One who is deft is:
(1) careful (2) dumb (3) skillful (4) hard of hearing (5) destructive

51. Dissonance is a term most often used in:
(1) art (2) music (3) law (4) medicine (5) sociology

52. A trite saying is:
(1) commonplace (2) brilliant (3) short (4) unusual (5) witty

53. To recapitulate is to:
(1) take (2) offend (3) solve (4) surrender (5) summarize

54. Excruciating means about the same as:
(1) returning (2) leaving (3) assembling (4) exhibiting (5) torturing

55. 20, 18, 24, 8, 6, 12, 4, , . What two numbers should come next?
(1) 2 and 8 (2) 6 and 12 (3) 2 and 4 (4) 8 and 16 (5) 2 and 6

56. Anger is to violence as love is to:
(1) caress (2) hate (3) temper (4) hope (5) happiness

57. 88, 76, 74, 62, 60, 48, . What number should appear in the blank?
(1) 36 (2) 50 (3) 52 (4) 98 (5) 46

58. Defray is to expense as discharge is to:
(1) cancel (2) obligation (3) salary (4) weapons (5) surface

59. 7, 4, 8, 5, 10, 7, ... , . What two numbers should come next?
(1) 4 and 8 (2) 11 and 8 (3) 13 and 10 (4) 12 and 8 (5) 14 and 11

Go on to the next page.

60. Facility means:
(1) firmness (2) surface (3) duplicity (4) expression (5) ease

61. Ambiguous is about the opposite of:
(1) definite (2) small (3) genuine (4) enigmatic (5) perpetual

62. 3, 14, 5, 12, 8, 2. If Christmas and New Year invariably fall on the same day of the week, square the first number and subtract half the second; if not, square the third number and subtract twice the fourth. Indicate the answer numbered the same as the difference.

63. The difference between two numbers is $\frac{1}{4}$. Their sum is 1. What are the two numbers?
(1) $\frac{6}{8}$ and $\frac{2}{8}$ (2) $\frac{1}{4}$ and $\frac{3}{4}$ (3) $\frac{1}{2}$ and $\frac{1}{4}$ (4) $\frac{2}{8}$ and $\frac{3}{8}$ (5) $\frac{3}{8}$ and $\frac{5}{8}$

64. Superlative means:
(1) superior (2) unlimited (3) the lowest (4) sensitive (5) unlike

65. 3, 9, 12, 36, 39, 117, . . . , ... What two numbers should come next?
(1) 120 and 360 (2) 120 and 234 (3) 234 and 236 (4) 351 and 354 (5) 121 and 363

66. A debonair person is:
(1) wealthy (2) old (3) hungry (4) courteous (5) disillusioned

67. A lucid question is:
(1) debatable (2) clear (3) lengthy (4) difficult (5) important

68. By how much must 12 be increased to stand in the same ratio to 21 as 30 does to 35?
(1) 6 (2) 9 (3) 3 (4) 14 (5) 5

69. John had $120. He spent part of his money and now has only $15. What per cent of his money did he spend?
(1) 92½ (2) 89$\frac{3}{10}$ (3) 91⅖ (4) 85 (5) 87½

70. Viniculture is to vines as aviculture is to:
(1) trees (2) bees (3) birds (4) farming (5) fish

71. To embellish is to:
(1) deface (2) beautify (3) destroy (4) blind (5) publish

72. A discerning person is:
(1) intrepid (2) immune (3) discriminating (4) radical (5) fearful

73. To disdain is to:
(1) pity (2) check (3) despise (4) discard (5) challenge

74. Hypocrisy is a form of:
(1) gambling (2) worship (3) sham (4) government (5) surgery

75. If the square root of forty-nine less the square root of two is a number less than the square of three, indicate the first answer; if it is more, indicate the fifth answer.

76. A decibel measures:
(1) electric current (2) temperature (3) walking distance (4) volume of sound (5) readability

77. Heinous is to odious as commendable is to:
(1) secret (2) affable (3) perplexing (4) laudable (5) act

78. A precocious child is:
(1) sickly (2) fretful (3) angelic (4) advanced (5) awkward

79. 3, 6, 8, 24, 27, 108, ... What number should appear in the blank?
(1) 432 (2) 112 (3) 324 (4) 132 (5) 216

Go on to the next page.

80. 4, 6, 7, 3, 2, 8, 9. Square the fourth number and subtract the third unless the fourth is odd and the fifth even; in that event square the fourth and subtract the second; in either case add 1 unless the first number is a multiple of 3 in which case add 2. Indicate the answer which is numbered the same as the result.

81. 16, 4, 1, 6, 24, 6, 3, 8, 32, ... , ... What two numbers should come next?
(1) 8 and 13 (2) 8 and 4 (3) 8 and 5 (4) 29 and 34 (5) 8 and 2

82. 1440, 240, ... , 12, 4. What number should appear in the blank?
(1) 16 (2) 24 (3) 20 (4) 48 (5) 72

83. If 3 is 6% of a number, what is the number?
(1) 30 (2) 90 (3) 50 (4) 15 (5) 31

84. A neophyte is a:
(1) worm (2) rock formation (3) planet (4) beginner (5) soldier

85. Furtive means about the same as:
(1) distant (2) stealthy (3) wicked (4) removed (5) advanced

86. 1, 5, 2, 3, 15, 12, 13, ... The next number would be:
(1) 14 (2) 10 (3) 60 (4) 65 (5) 45

87. Intimidate is to frighten as entreat is to:
(1) beseech (2) mollify (3) introduce (4) give (5) seek

88. Pulchritude means:
(1) well-dressed (2) new (3) overly large (4) physical beauty (5) out of season

89. To covenant is to:
(1) imitate (2) contract (3) discover (4) negotiate (5) fulfill

90. A sodality is a:
(1) fellowship (2) sex offense (3) hard substance (4) fight (5) drink

91. $^{20}/_{4}$ is to 4 as 45 is to:
(1) $\frac{1}{20}$ (2) 180 (3) 360 (4) 36 (5) 72

92. What is the average rate per hour of a vehicle that travels 403.2 miles in 3 hours and 12 minutes?
(1) 132.3 (2) 134.4 (3) 47.1 (4) 126 (5) 101.2

93. 3, 19, 2, 6, 9, 31, 17. If the square root of the second number is greater than the cube root of the fifth, square the third and subtract the first; if not, square the first and subtract the third unless the first is odd, in which case square the fourth and subtract the sixth. Indicate the answer which is numbered the same as the resulting difference.

94. 360, 72, , 6, 3. What number should appear in the blank?
(1) 18 (2) 9 (3) 36 (4) 12 (5) 15

95. A recrudescent disease is:
(1) fatal (2) non-recurring (3) active again (4) not curable (5) caused by filth

96. 33, 28, , 21, 19, . What two numbers should appear in the blanks?
(1) 23 and 17 (2) 26 and 14 (3) 24 and 18 (4) 25 and 16 (5) 23 and 15

97. A rapacious person is:
(1) hasty (2) boisterous (3) delighted (4) greedy (5) pleasing

98. An obsequious person is:
(1) popular (2) servile (3) wealthy (4) open-minded (5) witty

99. 6, 3, 4, 16, 8, 5, 6, 24, 12, . . . , . . . What two numbers should come next?
(1) 9 and 10 (2) 15 and 16 (3) 9 and 36 (4) 13 and 52 (5) 6 and 7

100. Sexagesimal pertains to:
(1) sex (2) the number 60 (3) the number 16 (4) elderly people (5) yachting

 The End. Look back over your work.

APPENDIX C

Aptitude Test

H-E Form

The Academic Progress Inventory

FORM HE

DIRECTIONS TO STUDENTS

Do not turn this page until directed to do so.

No marks of any kind are to be made on this test booklet. Answers are to be marked on a separate answer sheet, where there is also room for any rough figuring you may need to do.

Please be sure to observe the following rules:

Use the special pencil in marking all answers.

Make sure each mark is heavy and black. Mark only one answer for each question. If you change an answer, erase the first mark completely. Then mark your corrected choice.

As you work on the test, keep your place on the answer sheet. Make certain that the answer you are marking is numbered the same as the item you are answering.

Make sure that you attempt to answer each question even if you are not sure of the answer.

It is very important that you answer each question in turn and do not skip around. Thus, you should answer each question before you go on to the next question. Once you have finished answering the questions on one page you may go on to the next--but remember to answer every question.

The three practice exercises below are given so that you may see how to do the test.

Practice 1.

Oak is a kind of:

(1) wood (2) stone (3) metal (4) glass (5) liquid

Which word tells what **oak** is? Yes, **wood** is the answer. This answer has been correctly marked for you on the answer sheet.

Practice 2.

1, 2, 3, 4, 5, ..., ... What two numbers should come next?

(1) 1 and 2 (2) 9 and 1 (3) 10 and 7 (4) 22 and 20 (5) 6 and 7

On your answer sheet, mark the answer you think is correct. You should have marked response number 5 for practice question 2, since the answer (5) is correct.

Practice 3.

Scales are to fish as wool is to:

(1) cotton (2) sheep (3) birds (4) silk (5) lakes

What is the number of the best answer? Mark the response space numbered the same as the answer you think is correct. You should have marked number 2 for practice question 3, since **scales** are to **fish** as **wool** is to **sheep.**

You will have 55 minutes to work on this test. This should be sufficient time to finish all the questions if you work rapidly. Remember that you should answer each question before you move on to the next question.

Do not begin work until you are told to do so.

1. **Sexagesimal pertains to:**
(1) sex (2) the number 60 (3) the number 16 (4) elderly people (5) yachting

2. **6, 3, 4, 16, 8, 5, 6, 24, 12, , . What two numbers should come next?**
(1) 9 and 10 (2) 15 and 16 (3) 9 and 36 (4) 13 and 52 (5) 6 and 7

3. **An obsequious person is:**
(1) popular (2) servile (3) wealthy (4) open-minded (5) witty

4. **A rapacious person is:**
(1) hasty (2) boisterous (3) delighted (4) greedy (5) pleasing

5. **33, 28, , 21, 19, What two numbers should appear in the blanks?**
(1) 23 and 17 (2) 26 and 14 (3) 24 and 18 (4) 25 and 16 (5) 23 and 15

6. **A recrudescent disease is:**
(1) fatal (2) non-recurring (3) active again (4) not curable (5) caused by filth

7. **360, 72, , 6, 3. What number should appear in the blank?**
(1) 18 (2) 9 (3) 36 (4) 12 (5) 15

8. **3, 19, 2, 6, 9, 31, 17. If the square root of the second number is greater than the cube root of the fifth, square the third and subtract the first; if not, square the first and subtract the third unless the first is odd, in which case square the fourth and subtract the sixth. Indicate the answer which is numbered the same as the resulting difference.**

9. **What is the average rate per hour of a vehicle that travels 403.2 miles in 3 hours and 12 minutes?**
(1) 132.3 (2) 134.4 (3) 47.1 (4) 126 (5) 101.2

10. **$^{20}/_{4}$ is to 4 as 45 is to:**
(1) $^{4}/_{20}$ (2) 180 (3) 360 (4) 36 (5) 72

11. **A sodality is a:**
(1) fellowship (2) sex offense (3) hard substance (4) fight (5) drink

12. **To covenant is to:**
(1) imitate (2) contract (3) discover (4) negotiate (5) fulfill

13. **Pulchritude means:**
(1) well-dressed (2) new (3) overly large (4) physical beauty (5) out of season

14. **Intimidate is to frighten as entreat is to:**
(1) beseech (2) mollify (3) introduce (4) give (5) seek

15. **1, 5, 2, 3, 15, 12, 13, . . . The next number would be:**
(1) 14 (2) 10 (3) 60 (4) 65 (5) 45

16. **Furtive means about the same as:**
(1) distant (2) stealthy (3) wicked (4) removed (5) advanced

17. **A neophyte is a:**
(1) worm (2) rock formation (3) planet (4) beginner (5) soldier

18. **If 3 is 6% of a number, what is the number?**
(1) 30 (2) 90 (3) 50 (4) 15 (5) 31

19. **1440, 240, . . . , 12, 4. What number should appear in the blank?**
(1) 16 (2) 24 (3) 20 (4) 48 (5) 72

20. **16, 4, 1, 6, 24, 6, 3, 8, 32, . . . , ... What two numbers should come next?**
(1) 8 and 13 (2) 8 and 4 (3) 8 and 5 (4) 29 and 34 (5) 8 and 2

21. **4, 6, 7, 3, 2, 8, 9. Square the fourth number and subtract the third unless the fourth is odd and the fifth even; in that event square the fourth and subtract the second; in either case add 1 unless the first number is a multiple of 3 in which case add 2. Indicate the answer which is numbered the same as the result.**

Go on to the next page.

22. **3, 6, 8, 24, 27, 108, . What number should appear in the blank?**
(1) 432 (2) 112 (3) 324 (4) 132 (5) 216

23. **A precocious child is:**
(1) sickly (2) fretful (3) angelic (4) advanced (5) awkward

24. **Heinous is to odious as commendable is to:**
(1) secret (2) affable (3) perplexing (4) laudable (5) act

25. **A decibel measures:**
(1) electric current (2) temperature (3) walking distance (4) volume of sound (5) readability

26. **If the square root of forty-nine less the square root of two is a number less than the square of three, indicate the first answer; if it is more, indicate the fifth answer.**

27. **Hypocrisy is a form of:**
(1) gambling (2) worship (3) sham (4) government (5) surgery

28. **To disdain is to:**
(1) pity (2) check (3) despise (4) discard (5) challenge

29. **A discerning person is:**
(1) intrepid (2) immune (3) discriminating (4) radical (5) fearful

30. **To embellish is to:**
(1) deface (2) beautify (3) destroy (4) blind (5) publish

31. **Viniculture is to vines as aviculture is to:**
(1) trees (2) bees (3) birds (4) farming (5) fish

32. **John had $120. He spent part of his money and now has only $15. What per cent of his money did he spend?**
(1) 92½ (2) 89$\frac{3}{10}$ (3) 91⅔ (4) 85 (5) 87½

33. **By how much must 12 be increased to stand in the same ratio to 21 as 30 does to 35?**
(1) 6 (2) 9 (3) 3 (4) 14 (5) 5

34. **A lucid question is:**
(1) debatable (2) clear (3) lengthy (4) difficult (5) important

35. **A debonair person is:**
(1) wealthy (2) old (3) hungry (4) courteous (5) disillusioned

36. **3, 9, 12, 36, 39, 117, , . What two numbers should come next?**
(1) 120 and 360 (2) 120 and 234 (3) 234 and 236 (4) 351 and 354 (5) 121 and 363

37. **Superlative means:**
(1) superior (2) unlimited (3) the lowest (4) sensitive (5) unlike

38. **The difference between two numbers is ¼. Their sum is 1. What are the two numbers?**
(1) ⅝ and ⅜ (2) ¼ and ¾ (3) ½ and ¼ (4) ⅜ and ⅝ (5) ¾ and ⅝

39. **3, 14, 5, 12, 8, 2. If Christmas and New Year invariably fall on the same day of the week, square the first number and subtract half the second; if not, square the third number and subtract twice the fourth. Indicate the answer numbered the same as the difference.**

40. **Ambiguous is about the opposite of:**
(1) definite (2) small (3) genuine (4) enigmatic (5) perpetual

41. **Facility means:**
(1) firmness (2) surface (3) duplicity (4) expression (5) ease

Go on to the next page.

42. **7, 4, 8, 5, 10, 7, , . What two numbers should come next?**
(1) 4 and 8 (2) 11 and 8 (3) 13 and 10 (4) 12 and 8 (5) 14 and 11

43. **Defray is to expense as discharge is to:**
(1) cancel (2) obligation (3) salary (4) weapons (5) surface

44. **88, 76, 74, 62, 60, 48, . What number should appear in the blank?**
(1) 36 (2) 50 (3) 52 (4) 98 (5) 46

45. **Anger is to violence as love is to:**
(1) caress (2) hate (3) temper (4) hope (5) happiness

46. **20, 18, 24, 8, 6, 12, 4, , . What two numbers should come next?**
(1) 2 and 8 (2) 6 and 12 (3) 2 and 4 (4) 8 and 16 (5) 2 and 6

47. **Excruciating means about the same as:**
(1) returning (2) leaving (3) assembling (4) exhibiting (5) torturing

48. **To recapitulate is to:**
(1) take (2) offend (3) solve (4) surrender (5) summarize

49. **A trite saying is:**
(1) commonplace (2) brilliant (3) short (4) unusual (5) witty

50. **Dissonance is a term most often used in:**
(1) art (2) music (3) law (4) medicine (5) sociology

51. **One who is deft is:**
(1) careful (2) dumb (3) skillful (4) hard of hearing (5) destructive

52. **11, 7, 10, 12, 24, 20, 23, 25, . The next number should be:**
(1) 21 (2) 50 (3) 28 (4) 27 (5) 5

53. **A seismograph records:**
(1) music (2) blood pressure (3) writing (4) speed (5) quakes

54. **A bauble is a:**
(1) mistake (2) model (3) cup (4) trinket (5) shawl

55. **Resuscitate is to revivify as copy is to:**
(1) imitate (2) originate (3) model (4) prepare (5) serve

56. **Diamond is to jewel as gold is to:**
(1) ring (2) silver (3) element (4) mine (5) plentiful

57. **$\frac{3}{4}$ are how many thirds?**
(1) 3 (2) $3\frac{3}{5}$ (3) $2\frac{1}{2}$ (4) $2\frac{1}{5}$ (5) $1\frac{1}{8}$

58. **1529, 1478, 1427, 1376, 1325, . What number should come next?**
(1) 1274 (2) 1275 (3) 1254 (4) 1225 (5) 1224

59. **Base is to noble as lewd is to:**
(1) noisy (2) think (3) coarse (4) chaste (5) sensitive

60. **If three plus five is greater than seven and less than nine, indicate the fifth answer unless six is greater than five, in which case indicate the first answer.**

61. **What per cent of $400 is 4% of $500?**
(1) $16\frac{2}{3}\%$ (2) 5% (3) 10% (4) $2\frac{1}{2}\%$ (5) 3%

Go on to the next page.

62. **To be apathetic is to be:**
(1) enthused (2) informed (3) ignorant (4) indifferent (5) sincere

63. **Sodden means:**
(1) upturned (2) grassy (3) worthless (4) leaden (5) soaked

64. **A supercilious person is:**
(1) monstrous (2) illicit (3) humble (4) miserly (5) arrogant

65. **1, 4, 9, 16, 25, 36, , . What two numbers should come next?**
(1) 48 and 61 (2) 49 and 64 (3) 39 and 54 (4) 41 and 46 (5) 49 and 65

66. **A bulwark is a:**
(1) marker (2) fortification (3) monument (4) scaffold (5) guidepost

67. **13, 19, , 34, 43, . What two numbers should appear in the blanks?**
(1) 25 and 52 (2) 28 and 49 (3) 24 and 33 (4) 26 and 53 (5) 25 and 53

68. **3, 18, 6, 36, 12, , . What two numbers should come next?**
(1) 72 and 9 (2) 72 and 26 (3) 72 and 36 (4) 72 and 24 (5) 72 and 432

69. **Ponderous means:**
(1) concise (2) impotent (3) unconscious (4) weighty (5) mischievous

70. **9, 10, 5, 6, 3, 4, , . What two numbers should come next?**
(1) 3 and 4 (2) 1 and 2 (3) 2 and 3 (4) 8 and 9 (5) 5 and 2

71. **9, 18, 15, 30, 27, , . What two numbers should come next?**
(1) 24 and 21 (2) 64 and 61 (3) 54 and 108 (4) 54 and 51 (5) 36 and 33

72. **If eight is less than nine but more than six, indicate the fifth answer; if less than nine and less than six, indicate the fourth answer.**

73. **To metamorphose is to:**
(1) leap (2) see (3) occupy (4) liken (5) change

74. **Premeditation involves:**
(1) sleeping (2) curing (3) planning (4) looking back (5) hesitation

75. **Reimburse is to embezzle as regurgitate is to:**
(1) steal (2) swallow (3) specify (4) count (5) revivify

76. **Oblivion is a state of:**
(1) worry (2) fear (3) poverty (4) forgetfulness (5) thanksgiving

77. **An eccentric person is:**
(1) dishonest (2) thrifty (3) skeptical (4) peculiar (5) foolish

78. **93, 82, ..., 63, 55, 48. What number should appear in the blank?**
(1) 71 (2) 70 (3) 74 (4) 75 (5) 72

79. **House residence President United White of called States the of the the the is** If these words were arranged to make a good sentence, what would be the first letter of the second word in the sentence?
(1) H (2) p (3) o (4) r (5) t

80. **To blight is to:**
(1) shine (2) disappear (3) ruin (4) compress (5) ignore

Go on to the next page

81. **Meticulous is to slovenly as turbulent is to:**
(1) noisy (2) awesome (3) desirable (4) peaceful (5) vacillating

82. **If the sum of the squares of the successive odd numbers from 1 to 5 inclusive is less than seven times six, indicate the second answer; if more, indicate the third answer.**

83. **If the square of six less the square of four is an odd number divisible by 5, indicate the third answer; if not, indicate the fifth answer.**

84. **The sum of two numbers is 5; their product is 0. What are the two numbers?**
(1) 2½ and 2½ (2) 2 and 3 (3) 0 and 5 (4) 5 and 10 (5) ½ and 5½

85. **Arabian is to horse as Bengal is to:**
(1) tiger (2) sheep (3) Arabia (4) vegetable (5) Africa

86. **An azure sky is:**
(1) clouded (2) threatening (3) reddish (4) starry (5) blue

87. **Revoke is to cancel as elude is to:**
(1) refer (2) embark (3) await (4) evade (5) exalt

88. **1, 2, 4, 8, 16, 32, , . What two numbers should come next?**
(1) 36 and 40 (2) 58 and 59 (3) 33 and 34 (4) 48 and 64 (5) 64 and 128

89. **Vigilant is the opposite of:**
(1) negligent (2) tactful (3) pungent (4) typical (5) rampant

90. **A synopsis is a:**
(1) nerve part (2) disease (3) refutation (4) condensation (5) preface

91. **An ingenious person is:**
(1) vehement (2) stately (3) noble (4) sinless (5) inventive

92. **A stripling is a:**
(1) voter (2) highlander (3) tribesman (4) youth (5) vassal

93. **Conservative is the opposite of:**
(1) vigilant (2) liberal (3) reserved (4) inherent (5) discriminative

94. **19, 16, 14, 11, 9, 6, , . What two numbers should come next?**
(1) 3 and 0 (2) 3 and 1 (3) 4 and 1 (4) 8 and 11 (5) 5 and 2

95. **To diverge is to:**
(1) come together (2) amuse (3) branch off (4) plant (5) agree

96. **Acute means:**
(1) permeable (2) mighty (3) morose (4) inadequate (5) keen

97. **6, 12, , 27, 36, 46. What number should appear in the blank?**
(1) 18 (2) 19 (3) 24 (4) 15 (5) 14

98. **If a silver kopek is worth 40¢, how many kopeks can one buy for $216?**
(1) 540 (2) 360 (3) 864 (4) 5400 (5) 3600

99. **To delude is to:**
(1) mislead (2) carry away (3) bring (4) seek (5) demand

100. **A person of integrity is:**
(1) upright (2) neutral (3) prejudiced (4) ungainly (5) profound

The End. Look back over your work.

APPENDIX D

Aptitude Test

R Form

The Academic Progress Inventory

FORM R

DIRECTIONS TO STUDENTS

Do not turn this page until directed to do so.

No marks of any kind are to be made on this test booklet. Answers are to be marked on a separate answer sheet, where there is also room for any rough figuring you may need to do.

Please be sure to observe the following rules:

Use the special pencil in marking all answers.

Make sure each mark is heavy and black. Mark only one answer for each question. If you change an answer, erase the first mark completely. Then mark your corrected choice.

As you work on the test, keep your place on the answer sheet. Make certain that the answer you are marking is numbered the same as the item you are answering.

Make sure that you attempt to answer each question even if you are not sure of the answer.

It is very important that you answer each question in turn and do not skip around. Thus, you should answer each question before you go on to the next question. Once you have finished answering the questions on one page you may go on to the next--but remember to answer every question.

The three practice exercises below are given so that you may see how to do the test.

Practice 1.

Oak is a kind of:

(1) wood (2) stone (3) metal (4) glass (5) liquid

Which word tells what **oak** is? Yes, **wood** is the answer. This answer has been correctly marked for you on the answer sheet.

Practice 2.

1, 2, 3, 4, 5, ..., ... What two numbers should come next?

(1) 1 and 2 (2) 9 and 1 (3) 10 and 7 (4) 22 and 20 (5) 6 and 7

On your answer sheet, mark the answer you think is correct. You should have marked response number 5 for practice question 2, since the answer (5) is correct.

Practice 3.

Scales are to fish as wool is to:

(1) cotton (2) sheep (3) birds (4) silk (5) lakes

What is the number of the best answer? Mark the response space numbered the same as the answer you think is correct. You should have marked number 2 for practice question 3, since **scales** are to **fish** as **wool** is to **sheep.**

You will have 55 minutes to work on this test. This should be sufficient time to finish all the questions if you work rapidly. Remember that you should answer each question before you move on to the next question.

Do not begin work until you are told to do so.

1. **Hypocrisy is a form of:**
(1) gambling (2) worship (3) sham (4) government (5) surgery

2. **If eight is less than nine but more than six, indicate the fifth answer; if less than nine and less than six, indicate the fourth answer.**

3. **Vigilant is the opposite of:**
(1) negligent (2) tactful (3) pungent (4) typical (5) rampant

4. **A bauble is a:**
(1) mistake (2) model (3) cup (4) trinket (5) shawl

5. **Defray is to expense as discharge is to:**
(1) cancel (2) obligation (3) salary (4) weapons (5) surface

6. **Arabian is to horse as Bengal is to:**
(1) tiger (2) sheep (3) Arabia (4) vegetable (5) Africa

7. **If three plus five is greater than seven and less than nine, indicate the fifth answer unless six is greater than five, in which case indicate the first answer.**

8. **3, 18, 6, 36, 12, , . What two numbers should come next?**
(1) 72 and 9 (2) 72 and 26 (3) 72 and 36 (4) 72 and 24 (5) 72 and 432

9. **Oblivion is a state of:**
(1) worry (2) fear (3) poverty (4) forgetfulness (5) thanksgiving

10. **A lucid question is:**
(1) debatable (2) clear (3) lengthy (4) difficult (5) important

11. **If the square of six less the square of four is an odd number divisible by 5, indicate the third answer; if not, indicate the fifth answer.**

12. **To delude is to:**
(1) mislead (2) carry away (3) bring (4) seek (5) demand

13. **A seismograph records:**
(1) music (2) blood pressure (3) writing (4) speed (5) quakes

14. **The difference between two numbers is ¼. Their sum is 1. What are the two numbers?**
(1) ⅝ and ⅜ (2) ¼ and ¾ (3) ½ and ¼ (4) ⅝ and ⅜ (5) ⅜ and ⅝

15. **20, 18, 24, 8, 6, 12, 4, , . What two numbers should come next?**
(1) 2 and 8 (2) 6 and 12 (3) 2 and 4 (4) 8 and 16 (5) 2 and 6

16. **A stripling is a:**
(1) voter (2) highlander (3) tribesman (4) youth (5) vassal

17. **The sum of two numbers is 5; their product is 0. What are the two numbers?**
(1) 2½ and 2½ (2) 2 and 3 (3) 0 and 5 (4) 5 and 10 (5) ½ and 5½

18. **A neophyte is a:**
(1) worm (2) rock formation (3) planet (4) beginner (5) soldier

19. **⅚ are how many thirds?**
(1) 3 (2) 3⅗ (3) 2½ (4) 2⅗ (5) 1⅙

20. **What is the average rate per hour of a vehicle that travels 403.2 miles in 3 hours and 12 minutes?**
(1) 132.3 (2) 134.4 (3) 47.1 (4) 126 (5) 101.2

Go on to the next page.

21. **Dissonance is a term most often used in:**
(1) art (2) music (3) law (4) medicine (5) sociology

22. **Facility means:**
(1) firmness (2) surface (3) duplicity (4) expression (5) ease

23. **To blight is to:**
(1) shine (2) disappear (3) ruin (4) compress (5) ignore

24. **A bulwark is a:**
(1) marker (2) fortification (3) monument (4) scaffold (5) guidepost

25. **Premeditation involves:**
(1) sleeping (2) curing (3) planning (4) looking back (5) hesitation

26. **A discerning person is:**
(1) intrepid (2) immune (3) discriminating (4) radical (5) fearful

27. **An obsequious person is:**
(1) popular (2) servile (3) wealthy (4) open-minded (5) witty

28. **To diverge is to:**
(1) come together (2) amuse (3) branch off (4) plant (5) agree

29. **A debonair person is:**
(1) wealthy (2) old (3) hungry (4) courteous (5) disillusioned

30. **1440, 240, ... , 12, 4. What number should appear in the blank?**
(1) 16 (2) 24 (3) 20 (4) 48 (5) 72

31. **An azure sky is:**
(1) clouded (2) threatening (3) reddish (4) starry (5) blue

32. **A decibel measures:**
(1) electric current (2) temperature (3) walking distance (4) volume of sound (5) readability

33. **11, 7, 10, 12, 24, 20, 23, 25, ... The next number should be:**
(1) 21 (2) 50 (3) 28 (4) 27 (5) 5

34. **93, 82, ... , 63, 55, 48. What number should appear in the blank?**
(1) 71 (2) 70 (3) 74 (4) 75 (5) 72

35. **Acute means:**
(1) permeable (2) mighty (3) morose (4) inadequate (5) keen

36. **To recapitulate is to:**
(1) take (2) offend (3) solve (4) surrender (5) summarize

37. **3, 6, 8, 24, 27, 108, . . What number should appear in the blank?**
(1) 432 (2) 112 (3) 324 (4) 132 (5) 216

38. **Sexagesimal pertains to:**
(1) sex (2) the number 60 (3) the number 16 (4) elderly people (5) yachting

39. **A synopsis is a:**
(1) nerve part (2) disease (3) refutation (4) condensation (5) preface

40. **House residence President United White of called States the of the the the is** If these words were arranged to make a good sentence, what would be the first letter of the second word in the sentence?
(1) H (2) p (3) o (4) r (5) t

41. **John had $120. He spent part of his money and now has only $15. What per cent of his money did he spend?**
(1) 92½ (2) 89$\frac{3}{10}$ (3) 91⅔ (4) 85 (5) 87½

42. **A supercilious person is:**
(1) monstrous (2) illicit (3) humble (4) miserly (5) arrogant

43. **Base is to noble as lewd is to:**
(1) noisy (2) think (3) coarse (4) chaste (5) sensitive

44. **7, 4, 8, 5, 10, 7, . . . , . . . What two numbers should come next?**
(1) 4 and 8 (2) 11 and 8 (3) 13 and 10 (4) 12 and 8 (5) 14 and 11

45. **If the square root of forty-nine less the square root of two is a number less than the square of three, indicate the first answer; if it is more, indicate the fifth answer.**

46. **Pulchritude means:**
(1) well-dressed (2) new (3) overly large (4) physical beauty (5) out of season

47. **A sodality is a:**
(1) fellowship (2) sex offense (3) hard substance (4) fight (5) drink

48. **1, 2, 4, 8, 16, 32, . . , . . . What two numbers should come next?**
(1) 36 and 40 (2) 58 and 59 (3) 33 and 34 (4) 48 and 64 (5) 64 and 128

49. **One who is deft is:**
(1) careful (2) dumb (3) skillful (4) hard of hearing (5) destructive

50. **Ponderous means:**
(1) concise (2) impotent (3) unconscious (4) weighty (5) mischievous

51. **6, 3, 4, 16, 8, 5, 6, 24, 12, , . What two numbers should come next?**
(1) 9 and 10 (2) 15 and 16 (3) 9 and 36 (4) 13 and 52 (5) 6 and 7

52. **$\frac{20}{4}$ is to 4 as 45 is to:**
(1) $\frac{1}{20}$ (2) 180 (3) 360 (4) 36 (5) 72

53. **Ambiguous is about the opposite of:**
(1) definite (2) small (3) genuine (4) enigmatic (5) perpetual

54. **6 ,12, . . . , 27, 36, 46. What number should appear in the blank?**
(1) 18 (2) 19 (3) 24 (4) 15 (5) 14

55. **If the sum of the squares of the successive odd numbers from 1 to 5 inclusive is less than seven times six, indicate the second answer; if more, indicate the third answer.**

56. **To metamorphose is to:**
(1) leap (2) see (3) occupy (4) liken (5) change

57. **1529, 1478, 1427, 1376, 1325, . What number should come next?**
(1) 1274 (2) 1275 (3) 1254 (4) 1225 (5) 1224

58. **Anger is to violence as love is to:**
(1) caress (2) hate (3) temper (4) hope (5) happiness

59. **1, 4, 9, 16, 25, 36, , . What two numbers should come next?**
(1) 48 and 61 (2) 49 and 64 (3) 39 and 54 (4) 41 and 46 (5) 49 and 65

Go on to the next page.

60. **Furtive means about the same as:**
(1) distant (2) stealthy (3) wicked (4) removed (5) advanced

61. **Heinous is to odious as commendable is to:**
(1) secret (2) affable (3) perplexing (4) laudable (5) act

62. **33, 28, , 21, 19, . What two numbers should appear in the blanks?**
(1) 23 and 17 (2) 26 and 14 (3) 24 and 18 (4) 25 and 16 (5) 23 and 15

63. **4, 6, 7, 3, 2, 8, 9. Square the fourth number and subtract the third unless the fourth is odd and the fifth even; in that event square the fourth and subtract the second; in either case add 1 unless the first number is a multiple of 3 in which case add 2. Indicate the answer which is numbered the same as the result.**

64. **9, 18, 15, 30, 27, , . What two numbers should come next?**
(1) 24 and 21 (2) 64 and 61 (3) 54 and 108 (4) 54 and 51 (5) 36 and 33

65. **Resuscitate is to revivify as copy is to:**
(1) imitate (2) originate (3) model (4) prepare (5) serve

66. **19, 16, 14, 11, 9, 6, , , . What two numbers should come next?**
(1) 3 and 0 (2) 3 and 1 (3) 4 and 1 (4) 8 and 11 (5) 5 and 2

67. **360, 72, , 6, 3. What number should appear in the blank?**
(1) 18 (2) 9 (3) 36 (4) 12 (5) 15

68. **To disdain is to:**
(1) pity (2) cheek (3) despise (4) discard (5) challenge

69. **If a silver kopek is worth 40¢, how many kopeks can one buy for $216?**
(1) 540 (2) 360 (3) 864 (4) 5400 (5) 3600

70. **Revoke is to cancel as elude is to:**
(1) refer (2) embark (3) await (4) evade (5) exalt

71. **A rapacious person is:**
(1) hasty (2) boisterous (3) delighted (4) greedy (5) pleasing

72. **Reimburse is to embezzle as regurgitate is to:**
(1) steal (2) swallow (3) specify (4) count (5) revivify

73. **Intimidate is to frighten as entreat is to:**
(1) beseech (2) mollify (3) introduce (4) give (5) seek

74. **Viniculture is to vines as aviculture is to:**
(1) trees (2) bees (3) birds (4) farming (5) fish

75. **To be apathetic is to be:**
(1) enthused (2) informed (3) ignorant (4) indifferent (5) sincere

76. **13, 19, , 34, 43, . What two numbers should appear in the blanks?**
(1) 25 and 52 (2) 28 and 49 (3) 24 and 33 (4) 26 and 53 (5) 25 and 53

77. **3, 19, 2, 6, 9, 31, 17. If the square root of the second number is greater than the cube root of the fifth, square the third and subtract the first; if not, square the first and subtract the third unless the first is odd, in which case square the fourth and subtract the sixth. Indicate the answer which is numbered the same as the resulting difference.**

78. **Conservative is the opposite of:**
(1) vigilant (2) liberal (3) reserved (4) inherent (5) discriminative

79. **A precocious child is:**
(1) sickly (2) fretful (3) angelic (4) advanced (5) awkward

Go on to the next page

80. **By how much must 12 be increased to stand in the same ratio to 21 as 30 does to 35?**
(1) 6 (2) 9 (3) 3 (4) 14 (5) 5

81. **Superlative means:**
(1) superior (2) unlimited (3) the lowest (4) sensitive (5) unlike

82. **9, 10, 5, 6, 3, 4, , . What two numbers should come next?**
(1) 3 and 4 (2) 1 and 2 (3) 2 and 3 (4) 8 and 9 (5) 5 and 2

83. **1, 5, 2, 3, 15, 12, 13, . . . The next number would be:**
(1) 14 (2) 10 (3) 60 (4) 65 (5) 45

84. **3, 14, 5, 12, 8, 2. If Christmas and New Year invariably fall on the same day of the week, square the first number and subtract half the second; if not, square the third number and subtract twice the fourth. Indicate the answer numbered the same as the difference.**

85. **If 3 is 6% of a number, what is the number?**
(1) 30 (2) 90 (3) 50 (4) 15 (5) 31

86. **88, 76, 74, 62, 60, 48, . What number should appear in the blank?**
(1) 36 (2) 50 (3) 52 (4) 98 (5) 46

87. **An eccentric person is:**
(1) dishonest (2) thrifty (3) skeptical (4) peculiar (5) foolish

88. **Sodden means:**
(1) upturned (2) grassy (3) worthless (4) leaden (5) soaked

89. **Diamond is to jewel as gold is to:**
(1) ring (2) silver (3) element (4) mine (5) plentiful

90. **A trite saying is:**
(1) commonplace (2) brilliant (3) short (4) unusual (5) witty

91. **A recrudescent disease is:**
(1) fatal (2) non-recurring (3) active again (4) not curable (5) caused by filth

92. **3, 9, 12, 36, 39, 117, , , . What two numbers should come next?**
(1) 120 and 360 (2) 120 and 234 (3) 234 and 236 (4) 351 and 354 (5) 121 and 363

93. **An ingenious person is:**
(1) vehement (2) stately (3) noble (4) sinless (5) inventive

94. **To embellish is to:**
(1) deface (2) beautify (3) destroy (4) blind (5) publish

95. **16, 4, 1, 6, 24, 6, 3, 8, 32, , , . What two numbers should come next?**
(1) 8 and 13 (2) 8 and 4 (3) 8 and 5 (4) 29 and 34 (5) 8 and 2

96. **A person of integrity is:**
(1) upright (2) neutral (3) prejudiced (4) ungainly (5) profound

97. **Meticulous is to slovenly as turbulent is to:**
(1) noisy (2) awesome (3) desirable (4) peaceful (5) vacillating

98. **What per cent of $400 is 4% of $500?**
(1) 16⅔% (2) 5% (3) 10% (4) 2½% (5) 3%

99. **Excruciating means about the same as:**
(1) returning (2) leaving (3) assembling (4) exhibiting (5) torturing

100. **To covenant is to:**
(1) imitate (2) contract (3) discover (4) negotiate (5) fulfill

The End. Look back over your work.

APPENDIX E

Tables of Means, Standard Deviations and Sample Sizes

Table 8

Means and Standard Deviations of all Cells Involved in the Analysis of Variance in Table 1 (Verbal Data)*

	Facilitators (B_1)		Debilitators (B_2)		
	Males (C_1)	Females (C_2)	Males (C_1)	Females (C_2)	
E-H Sequence A_1	26.15 4.34 13	17.46 5.68 13	20.23 4.86 13	19.46 5.56 13	20.83 6.06 52
H-E Sequence A_2	20.08 5.85 13	29.15 11.96 13	22.46 6.81 13	21.54 8.60 13	23.31 9.29 52
R Sequence A_3	24.69 9.46 13	23.15 7.68 13	19.31 6.79 13	22.46 4.44 13	22.40 7.58 52
	23.46 7.36 39	23.26 10.03 39	20.67 6.35 39	21.15 6.58 39	22.18 7.83 156

*The three numbers in each cell are respectively: the mean, standard deviation, and sample size.

Table 9

Means and Standard Deviations of all Cells Involved in the Analysis of Variance in Table 2 (Quant. Data)*

	Facilitators(B_1)		Debilitators(B_2)		
	Males(C_1)	Females(C_2)	Males(C_1)	Females(C_2)	
E-H Sequence A_1	15.00 5.35 13	11.00 5.42 13	10.31 3.44 13	12.77 4.42 13	12.27 5.06 52
H-E Sequence A_2	11.69 3.43 13	13.85 6.51 13	9.77 3.58 13	12.85 6.34 13	12.04 5.39 52
R Sequence A_3	12.15 5.77 13	14.38 6.04 13	11.00 3.59 13	12.54 4.56 13	12.52 5.23 52
	12.95 5.16 39	13.09 6.16 39	10.36 3.57 39	12.72 5.18 39	12.28 5.22 156

*The three numbers in each cell are respectively: the mean, standard deviation, and sample size.

APPENDIX F

Raw Data

Data Used in Final Analysis

NUMBER	ITEM SEQ	ANXIETY TYPE	SEX	FACIL SCORE	DEBIL SCORE	APT TEST SCORE(V)	APT TEST SCORE(Q)
1	1	1	1	39	16	34	13
2	1	1	1	33	13	33	15
3	1	1	1	36	23	24	24
4	1	1	1	27	17	26	17
5	1	1	1	34	24	22	11
6	1	1	1	31	22	24	13
7	1	1	1	36	27	29	24
8	1	1	1	32	24	28	11
9	1	1	1	30	23	21	15
10	1	1	1	34	27	22	11
11	1	1	1	29	23	21	5
12	1	1	1	26	20	31	22
13	1	1	1	33	28	25	14
14	1	2	1	21	30	31	17
15	1	2	1	17	27	23	13
16	1	2	1	27	37	14	6
17	1	2	1	20	32	22	9
18	1	2	1	23	35	15	8
19	1	2	1	20	33	16	7
20	1	2	1	18	31	21	8
21	1	2	1	21	36	19	17
22	1	2	1	22	38	26	8
23	1	2	1	24	40	15	9
24	1	2	1	18	36	16	10
25	1	2	1	16	34	24	13
26	1	2	1	16	39	21	9
27	2	1	1	36	24	23	15
28	2	1	1	32	20	26	10
29	2	1	1	36	25	24	10
30	2	1	1	34	23	18	15
31	2	1	1	38	27	16	8
32	2	1	1	32	22	13	13
33	2	1	1	33	23	26	5
34	2	1	1	33	23	29	10
35	2	1	1	31	21	18	16
36	2	1	1	31	21	13	9
37	2	1	1	33	24	25	10
38	2	1	1	29	20	21	9
39	2	1	1	28	19	9	12
40	2	2	1	26	32	19	7
41	2	2	1	26	33	21	7
42	2	2	1	24	32	16	11

Data Used in Final Analysis (cont'd.)

NUMBER	ITEM SEQ	ANXIETY TYPE	SEX	FACIL SCORE	DEBIL SCORE	APT TEST SCORE(V)	APT TEST SCORE(Q)
43	2	2	1	20	30	24	8
44	2	2	1	24	34	12	8
45	2	2	1	18	29	30	10
46	2	2	1	20	33	19	20
47	2	2	1	16	30	18	9
48	2	2	1	18	32	28	7
49	2	2	1	23	38	16	12
50	2	2	1	12	28	28	6
51	2	2	1	19	38	38	9
52	2	2	1	17	44	23	13
53	3	1	1	40	12	21	8
54	3	1	1	37	24	14	5
55	3	1	1	32	21	31	16
56	3	1	1	30	20	21	8
57	3	1	1	37	27	18	10
58	3	1	1	31	23	36	25
59	3	1	1	30	22	47	12
60	3	1	1	31	25	34	10
61	3	1	1	29	25	13	16
62	3	1	1	23	20	28	22
63	3	1	1	21	18	14	11
64	3	1	1	18	16	19	7
65	3	1	1	29	27	20	8
66	3	2	1	25	34	16	8
67	3	2	1	19	29	19	15
68	3	2	1	22	33	19	10
69	3	2	1	21	32	21	9
70	3	2	1	17	29	26	17
71	3	2	1	21	33	12	5
72	3	2	1	22	34	18	10
73	3	2	1	20	33	9	5
74	3	2	1	21	35	29	14
75	3	2	1	17	32	34	15
76	3	2	1	20	37	11	13
77	3	2	1	19	38	18	11
78	3	2	1	16	39	19	11
79	1	1	2	25	22	19	8
80	1	1	2	33	30	13	14
81	1	1	2	18	15	20	5
82	1	1	2	27	24	19	7
83	1	1	2	27	24	19	23
84	1	1	2	31	28	22	12
85	1	1	2	28	26	26	7

Data Used in Final Analysis (cont'd)

NUMBER	SEQ	ANXIETY TYPE	SEX	FACIL SCORE	DEBIL SCORE	APT TEST SCORE(V)	APT TEST SCORE(Q)
86	1	1	2	27	25	15	5
87	1	1	2	24	23	12	12
88	1	1	2	29	28	18	9
89	1	1	2	26	25	27	21
90	1	1	2	24	24	7	8
91	1	1	2	26	26	10	12
92	1	2	2	21	37	17	7
93	1	2	2	21	37	16	11
94	1	2	2	21	37	19	14
95	1	2	2	18	36	20	10
96	1	2	2	20	39	18	12
97	1	2	2	19	38	9	14
98	1	2	2	20	39	12	5
99	1	2	2	18	38	20	8
100	1	2	2	13	33	20	12
101	1	2	2	15	37	31	19
102	1	2	2	20	43	28	18
103	1	2	2	16	43	22	19
104	1	2	2	14	43	21	17
105	2	1	2	40	10	38	16
106	2	1	2	35	18	37	22
107	2	1	2	30	15	44	21
108	2	1	2	29	21	54	28
109	2	1	2	32	24	17	5
110	2	1	2	27	20	28	14
111	2	1	2	30	23	31	16
112	2	1	2	30	24	13	11
113	2	1	2	25	20	22	8
114	2	1	2	33	29	18	8
115	2	1	2	26	22	38	14
116	2	1	2	26	24	23	6
117	2	1	2	27	26	16	11
118	2	2	2	22	35	37	15
119	2	2	2	24	37	11	6
120	2	2	2	19	32	17	9
121	2	2	2	22	35	40	24
122	2	2	2	19	33	18	10
123	2	2	2	19	35	27	12
124	2	2	2	21	37	14	15
125	2	2	2	21	37	21	5
126	2	2	2	19	35	25	27
127	2	2	2	23	39	16	8
128	2	2	2	18	35	18	8

Data Used in Final Analysis (cont'd.)

NUMBER	SEQ	ANXIETY TYPE	SEX	FACIL SCORE	DEBIL SCORE	APT TEST SCORE(V)	APT TEST SCORE(Q)
129	2	2	2	15	33	12	12
130	2	2	2	22	40	24	16
131	3	1	2	32	19	20	11
132	3	1	2	29	18	26	7
133	3	1	2	28	18	30	21
134	3	1	2	32	23	25	9
135	3	1	2	32	24	24	28
136	3	1	2	34	30	17	15
137	3	1	2	32	28	38	12
138	3	1	2	28	24	14	8
139	3	1	2	30	27	14	8
140	3	1	2	29	27	17	15
141	3	1	2	26	24	22	16
142	3	1	2	29	28	37	22
143	3	1	2	32	31	17	15
144	3	2	2	20	35	26	11
145	3	2	2	20	35	19	12
146	3	2	2	15	31	30	20
147	3	2	2	18	35	25	17
148	3	2	2	18	35	20	13
149	3	2	2	15	33	21	9
150	3	2	2	21	39	25	11
151	3	2	2	20	39	12	19
152	3	2	2	19	40	28	5
153	3	2	2	16	37	21	6
154	3	2	2	16	39	24	10
155	3	2	2	22	45	21	18
156	3	2	2	17	41	20	12

Data Discarded From Final Analysis

157	1	0	1	26	22	14	18
158	1	0	1	35	31	23	9
159	1	0	1	28	25	38	27
160	1	0	1	28	26	24	14
161	1	0	1	34	32	14	13
162	1	0	1	28	27	32	7
163	1	0	1	23	23	32	13
164	1	0	1	26	26	26	16
165	1	0	1	24	24	23	10
166	1	0	1	23	24	17	14
167	1	0	1	28	29	36	14

Data Discarded From Final Analysis (cont'd.)

NUMBER	ITEM SEQ	ANXIETY TYPE	SEX	FACIL SCORE	DEBIL SCORE	APT TEST SCORE(V)	APT TEST SCORE(Q)
168	1	0	1	28	30	16	7
169	1	0	1	25	27	37	8
170	1	0	1	25	28	14	10
171	1	0	1	24	27	28	12
172	1	0	1	31	35	15	17
173	1	0	1	26	30	19	14
174	1	0	1	25	29	17	5
175	1	0	1	27	33	27	13
176	1	0	1	19	25	16	3
177	1	0	1	25	32	32	14
178	1	0	1	26	33	21	15
179	1	0	1	23	31	22	3
180	1	0	1	25	34	21	8
181	2	0	1	35	26	12	7
182	2	0	1	27	19	17	10
183	2	0	1	30	23	42	18
184	2	0	1	30	24	25	3
185	2	0	1	28	23	29	17
186	2	0	1	27	23	19	16
187	2	0	1	37	34	26	16
188	2	0	1	28	25	30	11
189	2	0	1	28	26	19	12
190	2	0	1	30	28	27	10
191	2	0	1	34	32	18	8
192	2	0	1	26	25	14	10
193	2	0	1	22	21	21	9
194	2	0	1	24	23	8	10
195	2	0	1	30	29	22	11
196	2	0	1	25	24	36	12
197	2	0	1	33	32	22	10
198	2	0	1	28	28	5	7
199	2	0	1	23	25	13	8
200	2	0	1	26	29	18	8
201	2	0	1	28	31	31	8
202	2	0	1	27	30	18	13
203	2	0	1	24	28	15	8
204	2	0	1	24	29	43	14
205	3	0	1	31	30	30	23
206	3	0	1	26	25	28	35
207	3	0	1	29	28	16	7
208	3	0	1	28	27	29	13
209	3	0	1	25	25	45	17
210	3	0	1	24	24	25	19

Data Discarded From Final Analysis (cont'd.)

NUMBER	ITEM SEQ	ANXIETY TYPE	SEX	FACIL SCORE	DEBIL SCORE	APT TEST SCORE(V)	APT TEST SCORE(Q)
211	3	0	1	28	28	27	7
212	3	0	1	28	28	29	13
213	3	0	1	33	34	16	9
214	3	0	1	24	26	18	8
215	3	0	1	28	31	17	8
216	3	0	1	29	32	29	12
217	3	0	1	24	28	23	11
218	3	0	1	26	30	15	13
219	3	0	1	24	28	18	12
220	3	0	1	26	31	33	14
221	3	0	1	27	33	15	11
222	3	0	1	23	29	14	29
223	3	0	1	25	32	44	14
224	3	0	1	22	30	20	13
225	3	0	1	21	29	38	14
226	3	0	1	24	32	15	10
227	3	0	1	23	31	16	16
228	3	0	1	22	31	11	8
229	1	0	2	25	28	41	12
230	1	0	2	22	26	26	25
231	1	0	2	29	33	20	12
232	1	0	2	28	33	33	10
233	1	0	2	27	32	14	5
234	1	0	2	20	26	29	8
235	1	0	2	24	30	34	15
236	1	0	2	22	28	27	17
237	1	0	2	24	31	37	13
238	1	0	2	19	27	18	10
239	1	0	2	20	30	12	7
240	1	0	2	23	33	18	15
241	1	0	2	17	27	37	11
242	1	0	2	24	34	35	13
243	1	0	2	21	32	20	12
244	1	0	2	18	30	18	10
245	1	0	2	26	38	29	18
246	1	0	2	19	31	43	24
247	1	0	2	19	32	21	18
248	1	0	2	18	31	28	14
249	1	0	2	21	34	17	12
250	1	0	2	21	35	21	14
251	1	0	2	20	35	19	8
252	1	0	2	21	37	26	10
253	2	0	2	24	23	26	18

Data Discarded From Final Analysis (cont'd.)

NUMBER	ITEM SEQ	ANXIETY TYPE	SEX	FACIL SCORE	DEBIL SCORE	APT TEST SCORE(V)	APT TEST SCORE(Q)
254	2	0	2	29	28	25	7
255	2	0	2	22	22	19	17
256	2	0	2	24	25	20	15
257	2	0	2	22	23	32	16
258	2	0	2	26	28	31	10
259	2	0	2	17	20	13	8
260	2	0	2	27	31	25	6
261	2	0	2	25	29	20	14
262	2	0	2	26	31	18	5
263	2	0	2	28	33	12	13
264	2	0	2	26	32	17	8
265	2	0	2	22	28	41	13
266	2	0	2	25	32	28	13
267	2	0	2	23	30	19	20
268	2	0	2	23	32	10	9
269	2	0	2	20	30	17	9
270	2	0	2	25	35	23	8
271	2	0	2	21	32	21	11
272	2	0	2	21	32	25	21
273	2	0	2	20	32	19	10
274	2	0	2	22	34	16	8
275	2	0	2	22	34	24	9
276	2	0	2	22	34	20	11
277	3	0	2	25	25	33	16
278	3	0	2	27	27	13	19
279	3	0	2	28	29	36	14
280	3	0	2	28	29	12	6
281	3	0	2	23	25	27	7
282	3	0	2	25	27	15	6
283	3	0	2	24	26	18	14
284	3	0	2	26	29	37	17
285	3	0	2	26	30	34	15
286	3	0	2	22	26	25	7
287	3	0	2	18	22	23	9
288	3	0	2	23	28	17	10
289	3	0	2	26	31	31	12
290	3	0	2	26	32	13	11
291	3	0	2	30	37	23	8
292	3	0	2	27	34	20	11
293	3	0	2	20	30	25	11
294	3	0	2	23	33	18	9
295	3	0	2	22	33	28	13

Data Discarded From Final Analysis (cont'd)

NUMBER	ITEM SEQ	ANXIETY TYPE	SEX	FACIL SCORE	DEBIL SCORE	APT TEST SCORE(V)	APT TEST SCORE(Q)
296	3	0	2	26	38	15	11
297	3	0	2	22	34	16	11
298	3	0	2	22	36	25	19
299	3	0	2	22	36	44	22
300	3	0	2	23	37	17	10