

THE RELATIONSHIP BETWEEN OVERT VERBAL ATTITUDE RESPONSES
TOWARD CHEATING BEHAVIOR, ACHIEVEMENT NEEDS AND CHEATING
ON TEST ITEMS

by
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of the University of Maryland in partial fulfillment
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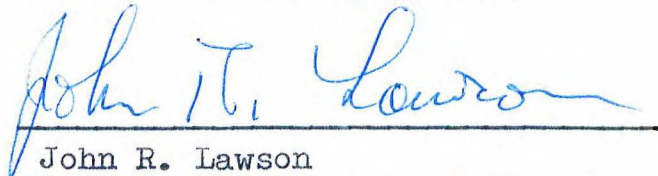
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APPROVAL SHEET

Title of Dissertation: THE RELATIONSHIP BETWEEN OVERT VERBAL ATTITUDE RESPONSES TOWARD CHEATING BEHAVIOR, ACHIEVEMENT NEEDS AND CHEATING ON TEST ITEMS

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ABSTRACT

Title of Dissertation: The Relationship between Overt Verbal Attitude Responses toward Cheating Behavior, Achievement Needs and Cheating on Test Items

Gloria Lorraine Alvernaz^{ap, et} MULCAHY, Doctor of Philosophy, 1967

~~Dissertation directed by:~~ ^(SUPERVISOR) Professor John R. Lawson

Purpose:

The purpose of this study was to investigate the relationship between overt verbal attitude responses of college students toward cheating behavior, achievement needs, and cheating behavior on test items. A further purpose of this study was to determine the relationship between grades and/or the number of errors made on an exam and cheating or non-cheating behavior.

Procedure:

The sample was comprised of sixty-six subjects-- thirty-three cheaters and thirty-three non-cheaters. A stratified random sample was drawn from 184 students in six sections of Education 110 classes at the University of Maryland. The cheaters were matched with a group of non-cheaters by sex and class.

The data was obtained in three separate experimental sessions. During the first session a 35 item multiple-response attitude measure was administered to the subjects during the usual class period. Attitude toward cheating

in a college setting was assessed utilizing an instrument developed by the writer in a pilot study. The second experimental session occurred one week after the presentation of the attitude measure. The McClelland n Achievement measure was administered using a set of four TAT-type pictures used to elicit imaginative stories which could be scored for the presence or absence of achievement related imagery. The third experimental session occurred two weeks after the administration of the n Achievement measure. During the third session the professor was absent from class by prior arrangement. The writer presented a twenty minute taped lecture which focused upon elementary statistical concepts. Immediately following the taped lecture the subjects were administered a 30 item multiple-response test. Subjects were provided with an opportunity to exhibit cheating behavior in a classroom setting while correcting their own examination papers after a copy of their original responses was surreptitiously recorded.

Findings:

1. There were no differences in verbal attitude responses toward cheating behavior between subjects who exhibited cheating behavior and those who did not.

2. There were no differences in achievement needs between subjects who exhibited cheating behavior and those who did not.

3. There were differences in the number of errors

made by subjects who exhibited cheating behavior and those who did not.

4. There were no differences in grades between subjects who exhibited cheating behavior and those who did not.

5. There were no differences in cheating and non-cheating behavior between subjects who scored high and low on a verbal (written) measure of attitudes toward cheating.

6. There were no differences in cheating and non-cheating behavior between subjects with high and low need achievement scores.

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CHAPTER I

THE PROBLEM--NATURE AND SCOPE

Statement of the Problem

The areas of research related to values, attitudes, beliefs, and ethical standards have been significant concerns of philosophers, historians, educators, psychiatrists, and behavioral scientists. Barrett (1961) indicates that the term "value" may be identified with a term possessed of a much longer history, namely "bonum". This concept occupies a prominent place in the works of Plato, Aristotle, Kant and others. Throughout the history of mankind an interest has been maintained in the problems man encounters when making choices between alternatives. This is frequently considered as the essence of the problem of values.

Some theorists use the words "value" and "attitude" interchangeably, whereas, others do not. The confusion in terminology seems to be based on the fact that values and attitudes have gained an extraordinary place in everyday speech and writing. Furthermore, the attitude and value concepts have been the focus of study for disciplines ranging from theology to economics. Difficulties have arisen in translating the terms across disciplines. Tisdale (1961) demonstrated this when he analyzed the term "value" as used by psychological theorists during the period from 1930 to

1960. He found that it was possible to systematically arrange the theory and research concerning values into five categories which seemed to describe best the particular variable which was being emphasized. Regardless of the theoretical differences among writers there is unanimity on one point--understanding social attitudes and values is fundamental for comprehending the complexities of human behavior.

The discord which is evident among researchers concerning a theoretical orientation toward values and attitudes is also present among those authors who concern themselves with the constructs: drive, need, habit, and motive. McClelland (1958a, 8) indicates that the decision as to which term should be utilized in a specific instance should depend not so much on ". . . the author's theoretical disposition as the method of measurement which provides the operational definition for the term." Traditionally, however, motive has been considered as the factor which drives or directs behavior. Psychologists have tended to distinguish between motivation and action, e.g., hunger may be the motivation whereas eating is the action.

Many methods for measuring individual differences in human motivation have been developed by psychological researchers. The accumulation of necessary empirical data, however, has been impeded due to the inadequacy of the measuring instruments. Consequently, the development of valid foundations essential for theoretical formulations

has been hindered. One approach to motivation assessment is that developed by Henry A. Murray (1937). His technique is based on Freud's notion that human motives are most clearly expressed in free-associative thought. His instrument, called The Thematic Apperception Test (TAT), requires the individual to create imaginative stories in response to a series of pictures. The content of the fantasy material is then analyzed to reveal underlying aims of behavior.

McClelland (1953a, 17) has asserted that one reason for using fantasy type responses rather than autonomic responses is ". . . the expectation that the possibility of identifying unique and differentiable signs for different motives was greater considering the variety and subtleties of human behavior."

Purpose of the Study

The purpose of this study is to investigate the relationship between overt verbal attitude responses of college students toward cheating behavior, achievement needs, and cheating behavior on test items. Attitude toward cheating in a college setting and achievement motive may be relevant factors related to test taking behavior; consequently, attitude toward cheating was assessed utilizing a questionnaire type instrument developed by the writer and achievement motive was measured utilizing McClelland's need achievement test. A further purpose of this study was to determine the relationship between grades and/or the number of errors

made on an exam and cheating or non-cheating behavior. Subjects (Ss) were provided with an opportunity to exhibit cheating behavior in a classroom setting while correcting their own examination papers after a copy of their original responses was surreptitiously recorded. The instruments used in this study facilitated the exploration of the specific interrelationships among verbal attitudes, needs and overt non-verbal behavior.

Definition of Terms

Attitude. Unless otherwise indicated, any reference to attitude in this study will indicate an implicit anticipatory response (R) which mediates overt behavior. Attitude as defined by Doob is ". . . an implicit, drive-producing response considered socially significant in the individual's society" (Doob, 1947, 135).

Implicit response. An implicit response is one which occurs within the organism and is not immediately observable. Doob (1947) conceptualized attitude as an implicit response.

Mediators. Mediators are internal phenomena or intervening variables which attempt to account for the organism's overt R and for the latency period between S and R. In this way an attitude acts as a mediator of Rs.

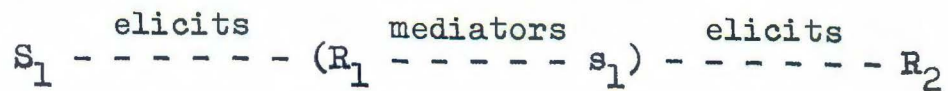
Need achievement. Utilizing McClelland's method of measurement, it is possible to refer to a motive or need as a disposition to strive for a particular type of

goal or aim, e.g., achievement, power, affiliation. An achievement oriented individual may direct his effort toward obtaining pleasure from success. The achievement goal is defined as success in competition with some standard of excellence (McClelland et. al., 1953, 110).

Specific Hypotheses Tested

Doob (1947) investigated the problem of what an attitude is and how it functions and related the concept of attitude to behavior theory. He argued that a definition was needed which would go beyond the stage of defining an attitude as ". . . the subjective counterpart of something in the environment, as a predisposition within the organism, or as being what the attitude scale measures" (Doob, 1947, 135). Doob ascertained that almost all researchers, regardless of their personal bias, would agree that attitudes are learned. If this assumption is valid, then an attempt to study attitudes as a branch of learning theory has merit. Within Doob's frame of reference an attitude is ". . . an implicit, drive producing response considered socially significant in the individual's society" (Doob, 1947, 135). The implicit response (R_1) occurs within the individual and is not immediately observable. The observable behavior (R_2) is another R in an overt behavioral sequence--it is a function of the implicit attitude R (R_1) and other tendencies (s) within the individual. What is expressed overtly by the individual results not only from attitude (R_1) but from other tendencies

(s) within the organism. The following paradigm demonstrates this relationship:*



Dukes (1955) states that attitudes are usually measured by verbal methods. It should be recognized, however, that non-verbal overt Rs are a part of the total R repertoire of the human organism and should be studied like other responses. The Hartshorne and May (1930) studies lend support to this notion. In their extensive research with children from grades five through eight, they found no specific relationship between moral knowledge and conduct. When questions of "rightness" and "wrongness" of conduct were asked of children who had and had not demonstrated cheating behavior, the same kinds of answers were received in about the same proportion.

DeFleur and Westie (1958), LaPiere (1934), Lohman and Reitzes (1954) indicate that an individual's verbal attitude response may be quite unrelated to what he actually does in a related situation involving an overt action. According to Doob behavior which is observable to the outsider is a function of the implicit attitude R and other tendencies within the individual. This theoretical

*S₁ refers to stimulus patterns.

formulation makes possible a fruitful exploration of the various functions of internal phenomena which mediate overt verbal and non-verbal behavior. In view of the research studies cited above, it would be expected that expressed verbal attitudes would not be predictive of subsequent behavior in a specific situation. The problem then is one of determining what variables are relevant to an individual's behavior in a specific setting. It would appear that motives and specific situational factors are the determiners of subsequent behavior.

McClelland et. al. (1953) indicate that the aim of a specific motive, such as need achievement, is a particular effect which is made possible by some kind of action. For example, cues in a situation involving a standard of excellence may arouse persistent striving which is aimed at attaining a goal. The achievement oriented individual may direct his effort toward obtaining pleasure from success. Behavioral correlates associated with need achievement which would be expected in a competitive college situation are cheating or non-cheating behavior. This study was designed to investigate the relationship between needs, attitudes, situational determinants, and overt behavior.

Specific hypotheses to be tested were:

A. There are no differences in verbal attitude Rs toward cheating behavior between Ss who exhibit cheating behavior and those who do not.

B. There are differences in achievement needs between Ss who exhibit cheating behavior and those who do not.

C. There are differences in the number of errors made by Ss who exhibit cheating behavior and those who do not.

D. There are no differences in grades between Ss who exhibit cheating behavior and those who do not.

E. There are no differences in cheating and non-cheating behavior between Ss who score high and low on a verbal (written) measure of attitude toward cheating.

F. There are differences in cheating and non-cheating behavior between Ss with high and low need achievement scores.

Significance of the Study

The many problems inherent in providing an adequate conceptualization of "attitude" are apparent when the vast number of divergent approaches to theoretical and operational definitions of the term are considered. The number of empirical studies focusing on the relationship between verbal attitude responses and overt non-verbal behavior are few (Jahoda and Warren, 1966; Rosenberg and Hoveland, 1960). The bulk of research has been directed toward the analysis of cognitive or affective aspects of attitudinal responses.

Behavioral scientists typically define attitude as "predispositions to respond in a particular way toward a specific class of objects" (Rosenberg and Hoveland, 1960).

The present study, however, was designed to provide empirical data which would extend Doob's unique theoretical formulation of the process involved in attitude dynamics. The study focuses upon the specific conditions under which individuals respond congruently or incongruently with regard to separate aspects of their attitudinal structure. Doob's learning paradigm for attitudes provides a precise theoretical structure within which the complexity and interrelationship among specific phenomena may be studied.

The present study also provides information which may help to clarify the phenomenon of inconsistency between verbal attitude Rs and overt action toward an object. The focus is upon relevant variables which may influence overt behavior of individuals in a specific situation. Consequently, the dynamics involved in cheating behavior in a college setting were studied, i.e., need achievement was assessed and relevant situational variables were manipulated in an experimental setting.

CHAPTER II

SELECTED RELATED RESEARCH

Research pertaining to this study focuses upon three separate phenomena--attitudes, motives, and cheating behavior. Material bearing directly upon the following issues will be discussed: verbally expressed attitudes and their overt behavioral consequences; need achievement; and cheating behavior.

Verbal Attitude Responses and Overt Behavior

Research studies indicate that an individual's verbalization of an attitude is often unrelated to his overt behavior in a specific situation. Hartshorne and May (1928-1930) in a three volume study concerning character education of children reported that phenomena including such variables as deception, cooperation, and persistence were groups of specific habits rather than general traits. They concluded that honest and deceptive behavior were situationally determined. Furthermore, their study demonstrated that knowledge of conduct in one type of setting was not predictive of specific actions over a wide range of situations (Hartshorne and May, 1930, 375).

The disparity which seems to exist between verbal and non-verbal attitude responses was evidenced in an early

study by LaPiere (1934). He and two Chinese associates sought accomodation in over two-hundred and fifty establishments, i.e. hotels and restaurants. They were refused service in only one of these. Following this LaPiere sent a questionnaire to all the establishments which had been visited requesting a statement of policy regarding accomodation of Chinese. The results of the questionnaire demonstrated that over ninety per cent of the hotels and restaurants expressed adherence to a policy of non-acceptance of Chinese. This demonstrated the discrepancy which often exists between the written attitude response and the subsequent related behavior.

In a more recent study, Lohman and Reitzes (1954) examined overt behavior or action attitudes of 151 Ss who were members of a particular urban neighborhood and a particular labor union. Incongruent norms regarding behavior toward Negroes prevailed in the two settings. The urban neighborhood organized a property owners' association to resist Negro penetration whereas Negroes were insured equality in the job setting, i.e., the labor union provided a clearly defined well-implemented policy toward Negroes.

DeFleur and Westie (1958) investigated three dimensions of the attitude construct, namely: verbal, autonomic-physiological, and overt. Expressed attitudes toward Negroes were found to be significantly related to actions taken by the Ss. Nevertheless, a third of the Ss responded in a manner inconsistent with their verbal statements regarding

Negroes. It should be indicated, however, that the nature of the overt behavior demands further inspection. First Ss were asked to sign a statement regarding a photograph of themselves to be taken with a Negro. Photograph authorization then, was used in a crude attempt to assess or classify an overt acceptance or avoidance behavior. The validity of the measure of overt behavior seems questionable in the DeFleur and Westie study. As a result of this criticism, inferences which can be drawn from the data are limited.

Research by Carr and Roberts (1965) was designed to examine the degree of consistency between verbal attitude responses toward civil rights participation and the level of involvement in and frequency of actual civil rights activities. Non-significant correlations were found between the various measures of expressed attitudes and actual behavior. The authors assert that the crucial determinants of social-action involvement are ". . . immediate, contextual field conditions . . ." (Carr and Roberts, 1965, 265).

The relationship between overt cheating behavior and direct and indirect indices of attitude toward cheating was investigated by Freeman and Atašv (1960). Three types of indirect attitude assessments were utilized. The first instrument was entitled "Honor System Questionnaire" (Freeman and Atašv, 1960, 444) in order to mask the actual intent of the measure. The Ss were asked questions, for example, about the number of college students who cheat.

The inference was then made that those Ss who indicated that a high proportion of students cheat were themselves cheaters. The validity of this inference is open to some question since research supports the notion that cheating is in fact a frequently used mode of behavior in a college exam type setting.

The remaining two types of attitude indices used by Freeman and Atašov were similar to a measurement used by Jacob Getzels (Freeman and Atašov, 1960). Both tests listed items which described hypothetical cheating type situations. The Ss were then asked to mark the situation as being a cheating or non-cheating situation on one form of the test and to mark the situation as being representative of rumor or fact on the other form of the test. Those Ss who perceived the contrived situations as "cheating" situations were themselves deemed cheaters. The validity of the measure warrants investigation.

The direct index of attitude toward cheating in the Freeman and Atašov study was a "yes" or "no" response to the question, "Have you ever cheated in an exam?" (1960, 444). Thirty-eight Ss responded "yes" and five responded "no." Since the question regarding cheating did not relate specifically to the exam situation in which the experimenters had measured actual cheating behavior, Ss who may not have cheated in the experimental situation may have been responding to prior cheating behavior. No significant correlations were found at the .05 level among any of the

measures. Although the validity of the measures used in this study have been criticized by the writer, the data support the hypothesis that no relationship exists between verbal assessment of attitude responses and overt behavior.

An experiment by Corey (1937) bears directly on the present study. The purpose of his research was to determine the relationship between attitude responses toward cheating behavior and actual cheating and non-cheating behavior. In Corey's research project, university students were provided with an opportunity to cheat on five objective tests given at one week intervals. Attitude toward cheating was assessed by the Corey unsigned questionnaire (Corey, 1937). The attitude test consisted of fifty attitude statements toward cheating on examinations. The Ss was required to make one of the following four responses to each statement provided: agree strongly, disagree strongly, disagree, and undecided. The data demonstrated that overt behavior as measured by the amounts Ss will change their own examinations when allowed to grade their own work is not related to attitudinal scores derived from a questionnaire type instrument measuring verbal responses toward cheating on examinations.

In summary, the research cited supports the hypothesis that verbally expressed attitudes in themselves do not predispose an individual to behave in a predictable fashion, i.e., the verbally expressed attitude may or may

not be reflected in the individual's subsequent behavior.

Need Achievement

The research related to need achievement which is relevant to this study deals with the reliability of the scoring procedure, and the validity and reliability of the measuring instrument n Achievement. Also, material dealing with individual differences in n Achievement scores as related to sex, task performance and risk taking behavior will be reviewed.

Reliability and Validity

Murray (1937) developed the TAT in order to demonstrate that imaginative stories stimulated by pictures would elicit and indicate the strivings of the individual. His work was based on Freud's assumption that the effects of motivation can be found in fantasy. McClelland et. al. (1953) utilized the thematic apperception method for collecting data concerning various types of motives.

In a study by Atkinson and McClelland (1948) it was found that stories written to TAT-type pictures differed in certain systematic ways among Ss who had been deprived of food for one, four, and sixteen hours. This finding provided the initial base for both a scoring system for presence of motives and for a quantitative estimate of motive strength. A crucial question remained concerning the applicability of this type of analysis of simple physiological needs to more

complex psychogenic needs. McClelland and his co-workers (1949) studied this question using "need achievement" as the psychogenic motive. By manipulating the conditions of ego-involvement an attempt was made to establish the hypothesis that psychogenic needs do in fact parallel the function of physiological needs. Differences were found among Ss responses to TAT type pictures as the conditions or instructions of the test were varied (McClelland, et. al., 1949). The results of the study support the hypothesis that the n Achievement score is a valid measure.

The original score-rescore reliability of the n Achievement projective test was .95 using a product-moment correlation. N Achievement scores were determined on four-story records of 30 Ss. Two judges worked together using scoring system A and rated the protocols on two separate occasions one month apart. Ninety-one per cent was the average index of agreement on the score-rescoring of the various achievement related categories. The index of agreement was computed by dividing twice the number of category agreements by the total number of times a specific category was marked on the two separate scoring sessions. Atkinson (1950) established a .95 product-moment correlation on 64 Ss using scoring system B. Eight story records were marked in sessions held six months apart. The average percentage agreement in score-rescoring of the various categories was 84.9 per cent.

Score-rescore reliabilities of .95 (McClelland, Clark, Roby and Atkinson, 1949), .93 (Atkinson, 1953), .95 (Veroff, Wilcox and Atkinson, 1953), .88 (Atkinson and Reitman, 1956), and .94 (Douvan, 1956) have been reported for n Achievement. Atkinson (1950) reported a .96 rank order correlation between a judge with limited experience, i.e., prior practice scoring of only 400 stories, and one with extensive experience. Seventy-eight per cent was the average index of agreement on the achievement related categories. Similar correlations and percentage agreement indices were established by judges using scoring system C after limited experience (Atkinson, 1950).

Researchers concurred that a scoring system for the n Achievement test which would not require investigators to learn the procedure in seminars with experts was highly desirable (Feld and Smith, 1958). It was deemed practicable to develop a scoring system which could be learned with the aid of a written manual which contained sets of practice materials.

Utilizing scoring procedure C, Feld and Smith (1958) found that twelve hours of independent practice produced high interjudge scoring reliabilities between novices who had learned the procedure from the manual and experts. Reliabilities obtained by novice scorers compared favorably with those established by experts, e.g., novice scorers' reliabilities were .90, .87, .83 (Feld and Smith, 1958, 238). The median Spearman Rank correlation coefficient for

these same novice scorers on a criterion set of thirty stories using familiar pictures was .87.

McClelland provided an extensive analysis of the reliability of the n Achievement instrument itself. He concluded that the projective test was not suitable for precise prediction concerning the standing of individuals on n Achievement but that ". . . its stability for purposes of group comparisons is fairly well established" (1953, 194). Lowell (1950) demonstrated that a product moment correlation between scores obtained on two forms of the n Achievement test was .22. This did not reach statistical significance, however, the two forms (three pictures in each comparable form of the test) did agree 72.5 per cent of the time in the placement of Ss above or below the median score. When all six pictures were given in the same testing situation the percentage agreement between the forms in placing Ss high or low in the distribution was 78.1 per cent. Under the same experimental conditions a product-moment correlation between the two forms of the test was .64.

Research (Lowell, 1950) has demonstrated that the n Achievement instrument is sensitive to conditions of stimulation preceding the testing situation. Accordingly, a high product moment correlation between measures on two separate occasions is tenable only if the conditions prior to the first session are duplicated for each S on the second session. The product moment correlation is greatly affected by a small number of extreme shifts in scores. This appears

to have occurred for a few Ss in Lowell's study, consequently the low reliability score resulted (McClelland, 1953).

Experiments indicate that a relationship exists between n Achievement scores and various other measures obtained in experimental sessions. This suggests that the test-re-test unreliability of the n Achievement instrument may be a spurious finding. The differences which occur in a Ss n Achievement score from one experimental session to the next may be a function of the first administration of the test.

Sex Differences

Research regarding the n Achievement phenomenon demonstrates that males and females respond differently to the n Achievement motive. For example, n Achievement scores of college women are found to be as high under relaxed experimental conditions as men or women under arousal conditions (Veroff, Wilcox, and Atkinson, 1953). Nonetheless, individual differences in n Achievement scores of both men and women maintained the same relationship to task performance. Data (Veroff, Wilcox, and Atkinson, 1953; and Field, 1951) support the hypothesis that although women do not show an increase in n Achievement scores as a result of achievement involving instructions, women's scores appear as valid as men's scores in that they relate to performance in a similar fashion.

Field (1951) collected information which bears directly on the issue concerning the failure of women's n Achievement scores to increase under arousal conditions. He was able to manipulate or actually increase women's n Achievement scores by arousing the Ss concern regarding social acceptance. The data seem to support the notion that women's n Achievement is related to social acceptability, whereas, men's n Achievement scores are related to leadership capacity and intelligence.

Lesser, Krawits and Packard (1963) in a study concerning n Achievement in high school girls suggested that sex-role identity must be assessed as well as n Achievement if motivational determinants of behavior are to be revealed. Their findings indicated that girls' n Achievement scores were predictive of academic competency (standard achievement test scores) only when the sex of the character in the TAT type picture was considered. Half of the TAT type stimuli presented to the Ss featured male figures and half featured female figures. Academically proficient girls related achievement themes to stimuli containing female figures while the opposite was true for girls with less demonstrable academic competence. Lesser et. al. (1963) suggest that achievement motivation of high school girls is influenced by the girls' perception of an appropriate sex-role activity.

The research cited in this section supports the notion that n Achievement scores for women and men differ in various complex ways. The unique motivational components

of the achievement related behavior of females is not congruent with males' achievement related behavior. Research has focused predominantly on male Ss due to the fact that the n Achievement instrument is more sensitive to achievement motivation in men than in women.

Task Performance and Risk-taking Behavior

The influence of achievement motivation on achievement performance has been repeatedly investigated in psychological experimentation. N Achievement has been found related to such diverse phenomena as level of aspiration expectations and performance (Kausler and Trapp, 1958), risk taking (McClelland, 1958), problem solving effectiveness (French and Thomas, 1958), preference for active vs. static images (Hurley, 1957), and recall of interrupted and completed tasks (Atkinson, 1953). The nature of the overt behavior being examined in the present study (i.e., cheating behavior in a classroom setting) renders it necessary to review research relating to the relevant situational aspects of the experiment. Literature relating to task performance and risk taking behavior will be examined.

Experiments (French, 1955; Atkinson, 1958; and Lowell, 1952) have demonstrated that a positive relationship exists between performance and n Achievement scores when the cues of the performance situation arouse the expectancy that a feeling of personal accomplishment, i.e., competition with a standard of excellence, will accompany a "good" performance.

The relationship between n Achievement and performance is maximized when a "sense of achievement" is aroused as opposed to other motives.

If cues for performance are experimentally manipulated giving the S no rationale for expecting that pride in accomplishment will accompany a "good" performance then the relationship between n Achievement scores and performance disappears (Atkinson, 1953; Atkinson and Raphelson, 1956). French (1955) has shown that an investigator who solicits the cooperation of Ss in an experiment may be eliciting n Affiliation type responses on the part of the Ss as opposed to n Achievement. In the same study it was discovered that if incentives unrelated to either n Achievement or n Affiliation were offered, the relationship disappeared between performance and the two motives.

In summary then, when expectancies of attaining several different types of incentives are perceived to be equally salient in a situation the determination of the motivating factors which direct the act becomes more difficult to delineate. The ideal achievement related situation is one in which the only reason for a response is to satisfy a specific achievement related motive.

Investigations concerned with assessing the relationship between achievement and performance on unusual types of tasks have been undertaken. McClelland (1961, 205) for example hypothesized that connecting links exist between economic development, the entrepreneur, and level of n

Achievement. The entrepreneur role as defined by McClelland (1961, 205) for example hypothesized that connecting links exist between economic development, the entrepreneur, and level of n Achievement. The entrepreneur role as defined by McClelland (1961, 210) calls for "decision-making under uncertainty." One of the striking characteristics of the entrepreneur is his willingness to take calculated risks--to innovate when there is a reasonable chance of a successful outcome (McClelland, 1961). It has been found that Ss with high n Achievement rather than those with low n Achievement scores tend to choose occupations involving some risk (McClelland, 1961).

Research concerning occupational preferences has been extended to include experiments focusing upon the degree of risk under which a S "prefers" to operate. In a study with five- and six-year-old children, Ss were allowed to stand wherever they wished when playing a ring toss game. Children with high n Achievement chose to stand at a moderate distance from the peg whereas children with low n Achievement did not demonstrate a preference. Often the low n Achievement children stood either very close to or very far away from the peg (McClelland, 1958b).

Similar to McClelland's study of children and risk taking behavior, Atkinson and Litwin (1960) replicated the ring toss situation for college students. Atkinson, Bastian, Earl and Litwin (1960) studied the risk taking phenomena using a shuffle board game and Litwin (1958) used a ring-toss

game, pitching pennies and a pencil maze. In all of these situations the Ss with high n Achievement scores chose to work on the tasks of moderate difficulty more often than Ss with low n Achievement scores.

It appears that both children and adults with high n Achievement seem to take moderate risks more readily than those individuals with low n Achievement. The low n Achievement Ss seem to prefer and also to exhibit either very safe or very speculative ventures or behavior.

Summary

The review of literature regarding need achievement has dealt with the reliability of the scoring procedure and of the reliability and validity of the instrument itself. It was indicated that high inter-judge reliability scores have been established. Also, a score for novice scorers (Ss learning the procedure from a manual) was found to be adequate for research purposes. The n Achievement instrument itself has adequate stability for purposes of group comparisons.

The n Achievement measure appears to be more sensitive to achievement motivation in men than in women. Nevertheless, women's scores on the n Achievement test are related to performance on various tasks. Women's n Achievement seems to be related to social acceptability whereas men's n Achievement appears to be related to leadership and intelligence.

A positive relationship seems to exist between performance scores and n Achievement scores if the cues of the performance situation arouse feelings toward a standard of excellence. On the other hand, if the arousal cues are focused upon eliciting other motives than n Achievement the relationship becomes unclear regarding what motives determine the resultant behavior.

In samples of both children and adults high n Achievement was related to moderate risk type behavior. Low n Achievement Ss, however, exhibited either very safe or very speculative behavior.

Cheating Behavior

The phenomenon of "cheating" has been studied from many diverse approaches. Researchers have attempted to delineate the factors which predispose an individual to cheat. Consequently, investigations of cheating behavior have dwelt upon demographic, personality, or situational factors that seem relevant to cheating behavior. Various attempts have been made to discover the relationship among intelligence, achievement scores, grades, and cheating behavior. Gross (1946), Howells (1938), Hartshorne and May (1928-1930), Campbell (1933), Drake (1941), and Hetherington and Feldman (1964) concur in the finding that Ss with low grades tend to cheat more than those with high grades. The implication of this finding, however, remains unclear. Howell (1938) demonstrated that by manipulating test

difficulty both the number of individuals cheating and the amount of cheating per individual increased. In a study with seventh graders Gross (1946) maintained that Ss cheating behavior varied over a five day period. Two-thirds of the Ss who cheated actually cheated only once. In contrast to the findings cited above, Woods (1957) demonstrated that there were no differences between the academic achievement of cheaters and non-cheaters. Brownell (1928) found that college cheaters were about equal to the campus average on intelligence measures.

There is evidence supporting the hypothesis that cheating behavior is related to various personality variables. Cheating has been linked to both extraversion (Keehn, 1956) and to neurotic tendencies (Campbell, 1933). Mischel and Gilligan (1964) discovered that cheating behavior in sixth grade boys was related to the strength of the motivation to attain prohibited gratification and the inability to delay immediate gratification. It was found that motivation to cheat could be manipulated by offering sixth grade children different types of rewards for winning a contest (Mills, 1958). Students who did not yield to cheating behavior when tempted by a desirable reward became more severe in their attitudes toward cheating whereas, those who cheated became more lenient in their attitudes toward cheating. In another study with sixth graders Rebelsky (1963) found that girls who portrayed confession in a projective type story

completion test were less likely to cheat in a subsequent temptation experiment than those who did not use confession. This relationship did not hold for boys.

Summary

An attempt was made in this chapter to clarify prevailing concepts regarding attitudes, motives, and cheating behavior as they pertain specifically to the dynamics of the present study. Attitude related research was reviewed with a particular emphasis upon verbally expressed attitudes as they correspond to overt non-verbal action. Data support the hypothesis that an individual's overt verbal attitude responses may be discrepant from his overt behavior in various specific situations.

Reliability and validity of the n Achievement instrument was deemed adequate for research purposes. The reliability of the scoring procedure for both experts and novices was sufficiently high to warrant the use of the novice scoring procedure in the present study. It was found that the n Achievement measure is more sensitive to achievement motivation in men than in women, however, women's n Achievement scores are significantly related to performance on various tasks. A positive relationship exists between n Achievement scores and various types of achievement related tasks. If a need to compete with a standard of excellence is aroused, then performance in a learning task is more predictable. Both children and adults who score high on n Achievement

measures seem to prefer moderate risks as opposed to either very safe or very speculative behavior.

Cheating behavior has been related to personality variables, intelligence, and academic achievement. In a classroom setting, however, cheating behavior appears, in part, to be a function of the number of errors made by a S.

CHAPTER III

DESIGN OF THE STUDY

The design of the present study encompassed four distinct operations. The first, was the development of two instruments: an attitude test which would assess overt verbal (written) responses toward cheating behavior in a college setting and the development of a statistics test dealing with material provided via a taped lecture. The second operation was concerned with determining scale-values to be used for scoring the attitude test and determining the reliability of the attitude test. The third operation involved the administration of the n Achievement instrument and the subsequent scoring of the measure. The fourth operation was to provide an experimental session in which the subjects were presented with a taped statistics lecture. Immediately following the taped lecture a test was given in which the subjects had the opportunity to exhibit cheating or non-cheating behavior.

Instruments

Three instruments were utilized in this study--an attitude test, the n Achievement measure, and a statistics test. The attitude test was designed by the writer to assess attitude responses toward cheating behavior among

college students. The McClelland n Achievement measure was used to measure individual differences in the strength of achievement motive. A test was constructed by the writer which covered elementary statistical concepts. This test was developed to provide a situation in which subjects would have the opportunity to exhibit cheating or non-cheating behavior in the classroom.

Development of an Attitude Measure

In an attempt to develop an attitude measure Steiniger (1964) designed a questionnaire which assessed attitudes toward cheating among college students. The questionnaire consisted of thirty-two descriptions of classroom situations based on all possible combinations of five variables, each with two levels. The variables included: interest level of course content; meaningfulness of tests; test difficulty; quality of teaching; and professor's staying or leaving during tests. Subjects were asked to rate the situations on five scales dealing with justification for cheating, urge to cheat, actual behavior in regard to cheating, guilt feelings about cheating, and letting others copy.

Steiniger's instrument in its entirety was not suitable for the present study, however, a variation of it appeared applicable. In order to determine the applicability of a variation of the Steiniger attitude measure a pilot study composed of four separate operations was

undertaken by the writer in December of 1966. Steiniger's thirty-two descriptions of classroom situations were used to develop an attitude test toward cheating behavior. Each situation, however, was to be rated on only one scale--actual behavior in regard to cheating. Five alternatives were provided as possible responses to each of the 32 situations established by Steiniger. The alternatives were:

1. Cheat as much as possible
2. Cheat on many answers
3. Cheat on several answers
4. Cheat on a few or on one answer
5. Cheat on no answers

The sample used in the pilot study was comprised of forty-five students enrolled in two Education 110 classes at the University of Maryland. Of the forty-five subjects to whom the attitude test was administered, thirty-one chose the alternative "cheat on no answers" as a response to each of the thirty-two descriptive situations provided. Consequently, the range of scores was inadequate and the test did not discriminate sufficiently among subjects. The results of the attitude test did not allow for dividing the subjects into high and low groups, i.e., those subjects who rated themselves as exhibiting cheating behavior and those subjects who rated themselves as not exhibiting cheating behavior.

Pair-Comparison. In order to circumvent the problem which occurred using the Steiniger type attitude test, a pair-comparison test was developed by the writer (see

Appendix A). Nine variables were determined to be possible modes of cheating behavior in a college setting. Utilizing the pair-comparison method (Edwards, 1957) the nine variables were combined in all possible pairs. The number of pairs for n stimuli is $n(n-1)/2$. When n is equal to 9 there are 36 pairs. The nine variables utilized in the pair-comparison test were as follows:

1. During an exam allow others to copy from your exam.
2. During an exam copy answers from others near you.
3. Hand in someone's old term paper for your course.
4. Allow someone to hand in your old term paper.
5. Discuss questions on a take home exam even though you were instructed not to do so.
6. Insert answers in a blue book before taking an exam.
7. Discover a clever method of concealing information--utilize it during an exam.
8. While correcting your own exam secretly change wrong answers.
9. While correcting someone's exam secretly change wrong answers.

Another sample was drawn from Education 110 students at the University of Maryland to participate in the second phase of the pilot study. The sample consisted of seventy subjects enrolled in four classes. From the responses obtained from seventy subjects on the pair-comparison test,

scale values were determined for each of the nine variables listed above (Edwards, 1957). The rank ordering of the nine variables and their subsequent scale values ranging from the response selected least often to the response selected most often are listed in Table I. The scale values for each of the nine attitude responses were used as a means of obtaining a final score on the attitude test.

TABLE I
RANK ORDER OF ATTITUDE RESPONSES AND
THEIR SUBSEQUENT SCALE VALUES

Rank Order of Nine Attitude Responses*	Scale Values
1. Insert answers in a blue book before taking an exam.	.000
2. Discover a clever method of concealing information--utilize it during an exam.	.224
3. During an exam copy answers from others near you.	.386
4. While correcting your own exam secretly change wrong answers.	.551
5. While correcting someone's exam secretly change wrong answers.	.624
6. Hand in someone's old term paper for your course.	1.408
7. During an exam allow others to copy from your exam.	1.435
8. Discuss questions on a take home exam even though you were instructed not to do so.	1.820
9. Allow someone to hand in your old term paper.	1.851

*The rank order is from response number one which was selected least often by the subjects to response nine which was selected most often by the subjects.

Attitude Test. The attitude test which was used in the present study was a thirty item test designed to assess attitude responses of college students toward cheating behavior (see Appendix B). Each item on the test described a classroom type situation and was based on the manipulation of combinations of the following nine variables:

1. Course content.
2. Nature of the course.
3. Quality of teaching.
4. Test difficulty.
5. Assignments.
6. Class size.
7. Testing situation.
8. Grading.
9. Type of class setting.

Four alternatives for each situation were randomly selected from the nine variables presented in the pair-comparison test. Each alternative depicted a specific overt behavior dealing with cheating behavior. The subject was to select one of the four alternatives as most representative of his response to the stated situation. The possible range of scores (using the established scale values) on the attitude test is from 6.220 to 51.049. As used in this study a low score indicated a positive attitude toward cheating behavior and a high score indicated a negative attitude toward cheating behavior.

Reliability. In the third phase of the pilot study, scores from the first and second administration of the attitude test were utilized in order to determine a reliability coefficient. The Pearson product-moment formula was used to derive the coefficient (Edwards, 1965).

Four sections of Education 110 at the University of Maryland were used in the sample. Ninety-four subjects were exposed to a test re-test situation. The second administration of the attitude test was given one week after the initial testing session.

Need Achievement

Motives or needs refer to a disposition to strive for a particular type of goal or aim--they drive or direct an individual's behavior. The thematic apperception method of data collection is based on the notion that the effects of motivation are apparent in fantasy responses. McClelland et. al. (1953) found that stories written to TAT-type picture differed in certain systematic ways among subjects when the cues were manipulated in achievement-related situations. An imaginative story then, is said to contain achievement imagery if it refers to an achievement goal. The achievement goal is defined as ". . . success in competition with some standard of excellence" (McClelland et. al., 1953, 110). In order to determine that a story contains achievement related imagery an individual's goal in the story must be one of success in terms of competition with some

standard of excellence.

Information pertaining to three aspects of the n Achievement measure will be examined in this chapter. First, the set of TAT-type pictures used in this study will be described. Secondly, procedures involving test administration and scoring will be discussed. Third, the reliability of the novice scoring procedure will be established.

Sets of Pictures. Research regarding n Achievement may be conducted using various sets of pictures which elicit imaginative stories. Normative information concerning responses to sets of pictures obtained under "neutral" test conditions has been provided by Atkinson (1958, 834-835). He has also constructed a recommended list of pictures drawn from a much larger selection provided by Ricciuti, Clark and Sadacca (1954-1955).

The set of four pictures used in the present study was selected from Atkinson's recommended list (see Appendix C). The pictures are the ones used in the original validation studies done on the n Achievement measure. It is the set most often employed in research with college groups (Atkinson, 1958, 834); consequently, it was selected as an appropriate measure for the present study.

Test Administration. Imaginative stories were obtained from subjects in a group setting during a regular college class session. An experimenter was introduced as a graduate student involved in collecting data for a research

project. The nature of the research was not revealed to the subjects.

Each subject received four 8½ by 14 inch sheets of paper with an identification number stamped on all four sheets. Four sets of questions were provided on each sheet of paper (see Appendix D). The intent of the questions was to insure complete coverage of a plot in each story.

The experimenter read the instructions (see Appendix E) to the group and then the first of the four pictures was presented on the screen for twenty seconds. The instructional cues used for the purposes of this study have been categorized by McClelland et. al. (1953, 101) as "neutral." The subjects were instructed to write about each picture using the questions provided on the answer sheet as an outline. Four minutes were spent in writing one story. The same procedure was utilized in obtaining responses to each of the four pictures. All four responses for each subject in the group were obtained without interruption.

Scoring Procedure. The n Achievement measure was scored in this study using scoring system "C" (McClelland, Clark and Lowell, 1958). The protocols were examined using a content analysis type procedure. The first step involved in the content analysis was to determine whether or not the story does in fact contain achievement related imagery. If the story contains any reference to an achievement goal, i.e. one character in the story is in competition with a standard of excellence, the subject receives a +1 score and

then the sub-categories are marked. If the story is not scored for achievement imagery (AI) then it is scored either 0 for doubtful or task related imagery (TI) or -1 for unrelated imagery (UI). The maximum score possible for a single story was +11 and the lowest score was -4. The n Achievement score was the sum of all the scores obtained on the responses to a set of pictures.

Various descriptive categories may be scored for each story if the criterion regarding achievement related imagery is met. The categories are as follows (McClelland, et. al., 1958):

1. Need (n)
2. Instrumental Activity (I+ or I? or I-)
3. Anticipatory Goal States (GA+ or GA-)
4. Obstacles or Blocks (BP or BW)
5. Nuturant Press (Nup)
6. Affective States (G+ or G-)
7. Achievement Thema (Ach Th)

Reliability of Novice Scoring. In a methodological study Feld and Smith (1958) demonstrated that high scoring reliabilities may be obtained by novice scorers or coders. The novice coders learned to score the n Achievement measure with a prescribed manual developed and revised by McClelland et. al. (1958). The scorers were trained without the assistance of a previously trained tutor. The results of the Feld and Smith study support the assertion that novice scorers demonstrate a high degree of precision in coding

thematic material with a minimum of training and use of practice materials.

Feld and Smith (1958) indicate that novice coders who have utilized a training procedure which entailed approximately twelve hours of independent practice are sufficiently accurate to be acceptable for research purposes. High interjudge scoring reliabilities were obtained between experts and novices. On a criterion set of thirty stories written to familiar pictures a median reliability coefficient of .87 was established for four coders (Feld and Smith, 1958, 239).

After a careful analysis of the McClelland et. al. (1958) scoring manual and independent practice in scoring protocols the writer obtained an interjudge reliability coefficient on a criterion set of thirty stories. The Spearman Rank correlation coefficient was utilized along with the correction factor for tied ranks (Siegel, 1956). The coefficient was determined using the following computations:

$$r_s = \frac{\sum x^2 + \sum y^2 - \sum d^2}{2\sqrt{\sum x^2 \sum y^2}}$$

where

$$x^2 = \frac{N^3 - N}{12} - T_x$$

$$y^2 = \frac{N^3 - N}{12} - T_y$$

The percentage agreement* index between the writer and the experts on the presence or absence of motive-related imagery was established. The writer obtained sufficiently high reliability coefficients plus percentage agreement indices on the practice materials to justify scoring the protocols obtained in the present study.

A score re-score reliability check on the writer as a novice coder was established on a set of thirty stories in the present study. The Spearman Rank correlation with the correction factor for tied ranks was established. The index of agreement for achievement imagery was also determined.

Statistics Test

In order to obtain an index of cheating behavior it was necessary to develop a test which could be administered to the sample of Education 110 students used in this study. A twenty minute taped lecture (see Appendix F for the text) was recorded which introduced basic concepts concerning statistical inference. A rationale for presenting the material concerning statistics to a group of education students was contained in the lecture (see Appendix F).

*The percentage agreement index was computed as follows:

$$2 \frac{\left(\begin{array}{l} \text{number of agreements between the writer and the} \\ \text{expert on the presence of achievement imagery} \end{array} \right)}{\begin{array}{l} \text{number of times the writer scored imagery} \\ + \text{number of times the expert scored imagery} \end{array}}$$

(Feld and Smith, 1958, 238)

A thirty-five item multiple-response statistics test was constructed by the writer (see Appendix G). The test covered the basic material which was contained in the text of the statistics lecture. In the fourth phase of the pilot study the writer presented the taped lecture to a group of twenty Education 110 students. The lecture was followed immediately by the statistics test. The range of errors made on the test in a sample of twenty subjects was from 8 to 19 items. The degree of difficulty of the test was such that a sufficient number of errors were made by each subject to ensure the opportunity for cheating behavior to occur. This appeared to justify the use of the statistics test in the present study as a means of obtaining an index of cheating behavior.

The Sample

The sample in this study consisted of Education 110 students at the University of Maryland. Education 110 is a junior level course which focuses upon human growth and development and learning and is taken prior to the student teaching experience.

The six sections of Education 110 were composed of 184 students--thirty-seven males and 136 females. A stratified random sample was drawn from this aggregate of subjects. The statistical analysis of the data necessitated dividing the subjects into two groups--cheaters and non-cheaters. Thirty-five subjects exhibited cheating behavior

on the statistics examination during the experimental session. The cheaters were matched with a group of non-cheaters by sex and class.

The sample used in the present study was comprised of sixty-six subjects--thirty-three cheaters and thirty-three non-cheaters (see Table II). Two subjects who had demonstrated cheating behavior were dropped from the original group. One subject was repeatedly absent; consequently, an n Achievement measure could not be obtained. The second subject was dropped from the sample because he did not participate in the attitude test.

TABLE II
STRATIFIED RANDOM SAMPLE

Class	Subjects	Sex		Groups	
		Male	Female	Cheaters	Non-Cheaters
I	10	2	8	5	5
II	10	2	8	5	5
III	14	6	8	7	7
IV	12	2	10	6	6
V	6	0	6	3	3
VI	14	2	12	7	7
$\Sigma = 6$	$\Sigma = 66$	$\Sigma = 14$	$\Sigma = 52$	$\Sigma = 33$	$\Sigma = 33$

General Procedures for Data Collection

Data collected in this study was obtained in three separate experimental sessions. The sample used consisted

of 184 (male and female) junior level students enrolled in Education 110 at the University of Maryland.

During the first experimental session a thirty item multiple-response attitude test was administered to the subjects. The test was given during the regular class period by a graduate student. The experimenter was introduced as a graduate student involved in a research project. The attitude test designed by the writer was used in order to assess the attitude responses of subjects toward cheating behavior (see Appendix B). The test answer sheet was marked with a code number in order to insure anonymity of each subject.

The second experimental session occurred one week after the presentation of the attitude test. The McClelland n Achievement measure was administered during a regular class period. A set of four TAT-type pictures was used in order to elicit imaginative stories which could be scored for the presence or absence of achievement related imagery. Each picture was projected onto a screen using an overhead projector. The subjects were allowed to view one picture for twenty seconds; then they were asked to write a story about the picture using the four questions printed on the answer sheet as an outline (see Appendix D). A minute was allowed for answering each question. Consequently, four minutes were spent in writing a response to each picture. The same procedure was followed in obtaining stories on the remaining three pictures. Each answer sheet was marked with an

identification number in order that scores from the three testing sessions could be matched for each subject.

The third experimental session occurred two weeks after the administration of the n Achievement test. During the third session the professor was absent from class by prior arrangement. The writer explained to the class that the professor would return during the second half of the class period. The writer further indicated that she had been instructed to present a twenty minute taped lecture to be followed by a quiz. Immediately following the taped lecture the subjects received a thirty item multiple-response test. All tests were collected by the writer and the subjects allowed to take their usual ten minute free period occurring at the end of the first hour of class. During the pause the writer surreptitiously thermofaxed a copy of each subject's answer sheet. Upon returning to class, each subject was allowed to score his own exam. The writer recorded the correct answers on the chalk board; consequently, the amount of risk involved in changing answers was minimized. The subjects were asked to record the number of errors made at the top of their answer sheet.

Anxiety which may have been aroused during the testing situation was alleviated by the professor upon his return. He announced that the test scores would not be used for evaluative purposes in the course.

After matching each subject's name with his code number in order to record cheating or non-cheating

responses, the list of student names was destroyed. Only, the coding system was used for identification purposes.

Statistical Procedures

This study was designed to investigate the relationship between overt verbal attitude responses of college students toward cheating behavior, achievement needs, and cheating behavior on test items. A further purpose of this study was to determine the relationship between grades and/or the number of errors on an exam and cheating or non-cheating behavior.

Two groups were examined in this study: one was comprised of subjects who had exhibited cheating behavior; and the other was comprised of subjects who had not exhibited cheating behavior. Four scores were obtained on each subject in the two groups: an attitude score; n Achievement score; a grade for the course; and the number of errors made on the statistics examination. The intent was to compare these four variables in terms of possible differences which exist between the two groups.

To accomplish the testing of the research hypotheses the analysis of variance technique was utilized. The two groups, i.e., cheaters and non-cheaters, were compared on four independent variables--attitude response, n Achievement, grade and number of errors. The formula used for each of the four comparisons between groups was:

$$F = \frac{MSB}{MSE}$$

where MSB is the mean square between samples and MSE is the mean square error (Freund, Livermore, and Miller, 1960, 51).

A further purpose of this study was to investigate the relationship between high and low scores on the attitude test and the n Achievement measure or non-cheating behavior. The median score was used as the dividing point for establishing high and low scores on both the attitude and n Achievement measure. The chi-square technique was utilized in order to compare the significance of the difference between the frequency distributions of the two groups (i.e. cheaters and non-cheaters) on two separate measures--attitude response and n Achievement. The formula used for the two comparisons was:

$$\chi^2 = \frac{(f_i - F_i)^2}{F_i}$$

where f_i is the observed frequency in i^{th} class, and F_i is a corresponding theoretical or expected frequency for that class, and the number of classes is equal to c (Edwards, 1965).

CHAPTER IV

ANALYSIS OF THE DATA

The analysis of data collected in this study involved three operations. The first of these was the establishment of reliability indices for the following: the attitude measure; the writer as a novice coder of n Achievement protocols; and the score-re-score consistency of the writer in coding n Achievement stories obtained in the study. The second operation focused on determining the degree of difficulty of the statistics test. As has been previously indicated the statistics test was developed in order to provide an examination upon which Ss could exhibit either cheating or non-cheating behavior. The third operation involved the testing of the hypotheses stated in this study.

The reliability indices obtained on the above measures will be reported. Also, each hypothesis will be stated and the findings reported. In the analysis of the data symbols will be used to represent the following: p for the level of significance; ns for no significance; and N for the number of Ss in the sample.

Reliability Indices

A reliability test was utilized to assess the consistency with which the attitude test measured the variables

it was designed to assess. Furthermore, reliability tests were used in order to evaluate the level of competence of the writer in scoring protocols written in response to TAT-type pictures.

Attitude Test

In the pilot study, scores obtained from the first and second administration of the attitude test were used to determine a reliability coefficient. With an N of 94 in a test re-test situation a product-moment reliability coefficient of .89 was established. The test scores ranged from 20.65 to 50.45 on the initial test and from 17.33 to 50.96 on the re-test. The mean score for the initial test was 41.91 and 43.50 for the second administration. These results demonstrated that the attitude measure was a highly reliable instrument. This justified its use as a measure of attitude toward cheating behavior for the purposes of the present study.

Scoring of n Achievement

The writer used the instructions and practice material provided by McClelland et. al. (1958) and Feld and Smith (1958) for learning the method of content analysis for obtaining n Achievement scores. Four sets of practice protocols were scored and reliability coefficients were determined for responses written to three sets of thirty pictures (see Table III). The Spearman Rank correlation coefficient was utilized along with the correction factor

for tied ranks. An interjudge reliability coefficient of .93 on a criterion set of thirty stories was established. The percentage agreement index between the writer and the experts regarding the presence or absence of motive-related imagery was established for the responses written to the same three sets of 30 pictures (see Table III). The index of agreement was found to be 91 per cent on the criterion set of thirty stories. The writer obtained sufficiently high reliability coefficients plus percentage agreement indices on the practice materials to justify scoring the protocols obtained in the present study.

TABLE III

PERCENTAGE AGREEMENT IN SCORING IMAGERY AND RANK-ORDER CORRELATIONS BETWEEN n ACHIEVEMENT SCORES BY A NOVICE CODER AND AN EXPERT

Motive	Reliability Index	Set I	Story Set* Set II	Set III**
<u>n</u> Achievement	%	.93	.88	.91
	Rho	.89	.77	.93

*Each set of stories consisted of 30 stories.

**Set III was the criterion measure for stories written to familiar pictures.

A score-re-score reliability check on the writer as a novice coder was established on a set of thirty stories used in the present study. The Spearman Rank correlation with the correction factor for tied ranks was established

at .92. The index of agreement for achievement imagery was 100 per cent.

Statistics Test

In order to obtain a measure of cheating behavior the writer developed a 35 item multiple response statistics test on which Ss could exhibit cheating or non-cheating behavior. As has been indicated the usefulness of the test was explored in the pilot study with an N of 20. The range of errors made on the test was from 8 to 19 items. The mean number of errors was 13.70. The degree of difficulty of the test was such that a sufficient number of errors were made by each S to ensure the opportunity for cheating behavior to occur. This justified the use of the statistics test in the present study as a means of obtaining an index of cheating behavior.

Hypotheses Tested

The six hypotheses listed in the study were tested using the analysis of variance technique and the chi-square design. Four hypotheses were tested by computing an F value using the analysis of variance method of statistical analysis. An F value which reached the .05 level of significance was considered acceptable.

Two hypotheses were tested using the chi-square statistic. A χ^2 value which reached the .05 level of significance was considered acceptable.

Hypothesis A

Hypothesis A is as follows: There are no differences in verbal attitude Rs toward cheating behavior between Ss who exhibit cheating behavior and those who do not.

This hypothesis was tested by comparing scores obtained on the attitude measure of Ss who exhibited cheating behavior and Ss who had not exhibited cheating behavior. There were no significant differences found; consequently, hypothesis A was supported. Table IV provides the results of the analysis of variance of scores obtained on the attitude measure by Ss in the cheating and non-cheating group.

TABLE IV

ANALYSIS OF VARIANCE OF SCORES OBTAINED ON THE ATTITUDE MEASURE FOR CHEATERS AND NON-CHEATERS

Source of Variation	Sum of Squares	df	Mean Squares	F*	p
Between Groups	3.97	1	3.97	.07	ns
Within Groups	<u>3,259.67</u>	<u>64</u>	50.93		
Total	<u>3,263.64</u>	65			

* $F_{.05} = 3.99$ for 1 and 64 df.

Hypothesis B

Hypothesis B states that: There are differences in achievement needs between Ss who exhibit cheating behavior and those who do not.

Hypothesis B was tested by comparing the n Achievement scores of Ss who exhibited cheating behavior with those

Ss who did not exhibit cheating behavior. There were no significant differences found, and hypothesis B was not supported. Table V depicts the analysis of variance of n Achievement scores of Ss who demonstrated cheating and non-cheating behavior.

TABLE V
ANALYSIS OF VARIANCE OF n ACHIEVEMENT SCORES
OF CHEATERS AND NON-CHEATERS

Source of Variation	Sum of Squares	df	Mean Squares	F*	p
Between Groups	8.74	1	8.74	.35	ns
Within Groups	<u>1,590.76</u>	<u>64</u>	24.84		
Total	1,599.50	65			

* $F_{.05} = 3.99$ for 1 and 64 df.

Hypothesis C

Hypothesis C states: There are differences in the number of errors made by Ss who exhibit cheating behavior and those who do not.

The testing of this hypothesis was achieved by comparing the number of errors made on a statistics exam by Ss who exhibited cheating behavior and those who did not. There was a significant difference found; consequently, hypothesis C was supported. Table VI provides the results of the analysis of variance determined on the statistics exam and cheating and non-cheating behavior.

TABLE VI
ANALYSIS OF VARIANCE OF THE ERRORS MADE ON AN EXAM
AND CHEATING AND NON-CHEATING BEHAVIOR

Source of Variation	Sum of Squares	df	Mean Squares	F*	p
Between Groups	82.97	1	82.97	5.24	s
Within Groups	1,013.40	64	15.83		
Total	1,096.37	65			

*F_{.05} = 3.99 for 1 and 64 df.

Hypothesis D

Hypothesis D is as follows: There are no differences in grades between Ss who exhibit cheating behavior and those who do not.

Hypothesis D was tested by comparing the grades received for Education 110 by Ss who exhibited cheating and non-cheating behavior on the statistics exam. There were no significant differences found; therefore, hypothesis D was supported. In Table VII the results are reported for the analysis of variance determined on course grades and cheating and non-cheating behavior.

TABLE VII
ANALYSIS OF VARIANCE OF COURSE GRADES AND
CHEATING OR NON-CHEATING BEHAVIOR

Source of Variation	Sum of Squares	df	Mean Squares	F*	p
Between Groups	.38	1	.38	1.26	ns
Within Groups	19.22	64	.30		
Total	19.60	65			

*F_{.05} = 3.99 for 1 and 64 df.

Hypothesis E

Hypothesis E states that: There are no differences in cheating and non-cheating behavior between Ss who score high and low on a verbal (written) measure of attitudes toward cheating.

In order to test this hypothesis the Ss were divided at the median of the scores on the attitude measure. As indicated in Chapter III, Ss who scored above the median on the attitude measure maintained a negative attitude toward cheating behavior whereas Ss who scored below the median maintained a positive attitude toward cheating behavior. Differences in the number of cheaters in the positive and negative group were tested using the chi-square technique. The results of this analysis are shown in Table VIII.

TABLE VIII

POSITIVE AND NEGATIVE ATTITUDES TOWARD CHEATING AND
CHEATING AND NON-CHEATING RESPONSES

Attitude toward Cheating	Overt Behavior		Total
	Cheating	Non-Cheating	
Positive	18	15	33
Negative	15	18	33
Total	33	33	66

$$x^2 = .52; p \ .05 \ ns.$$

Hypothesis F

Hypothesis F is as follows: There are differences in cheating and non-cheating behavior between Ss with high

and low need achievement scores.

Hypothesis F was tested utilizing the chi-square test of differences. The Ss were divided at the median on scores obtained on the n Achievement measure. For purposes of this study Ss who scored above the median on the measure were designated as individuals with high achievement motive and those who scored below were designated as individuals with low achievement motive. Differences in the number of cheaters in the high and low group were tested and the results are represented in Table IX.

TABLE IX

HIGH AND LOW ACHIEVEMENT MOTIVE AND CHEATING
AND NON-CHEATING RESPONSES

<u>n</u> Achievement	Overt Behavior		Total
	Cheating	Non-Cheating	
High	16	17	33
Low	<u>17</u>	<u>16</u>	<u>33</u>
Total	<u>33</u>	<u>33</u>	66

$$x^2 = .01; p \quad .05 \quad ns.$$

Summary

Sufficiently high reliability indices were obtained for the following: the attitude test designed by the writer; the writer as a novice coder of n Achievement protocols; and score re-score consistency of the writer in coding n Achievement stories. The degree of difficulty of the statistics test was such that it ensured the opportunity for cheating or non-cheating behavior to occur.

Six hypotheses were tested in this study using the analysis of variance technique and the chi-square design. Of the four hypotheses tested by means of the analysis of variance technique three were supported and one was not supported. Of the two hypotheses tested utilizing the chi-square design, one was supported and the other was not supported.

CHAPTER V

CONCLUSIONS, LIMITATIONS, IMPLICATIONS AND SUMMARY

Conclusions

The intent of this study was to investigate the relationship between overt verbal attitude responses, achievement motive, situational variables, and subsequent related overt non-verbal responses. The findings of the study are relevant to the sample drawn from Education 110 classes at the University of Maryland. The results reported in Chapter IV seem to warrant the following conclusions:

1. Verbal attitude Rs toward cheating behavior were measured utilizing an attitude assessment developed by the writer. In testing hypothesis A no differences were found on attitude scores obtained by Ss who exhibited cheating or non-cheating behavior on an exam. This finding lends support to the notion that an individual's verbalization of an attitude may be either congruent or incongruent with his subsequent behavior (Hartshorne and May, 1930; LaPiere, 1934; Carr and Roberts, 1965). In addition, it suggests that Doob's argument against the commonly accepted definition of the attitude construct has validity. Doob asserted that a new definition was essential; one which would go beyond defining attitude as a predisposition to act. The data in this study demonstrated that the overt verbal

attitude R did not in fact predispose the individual to behave in any predictable direction. Doob's learning paradigm pertaining to attitudes provides a theoretical structure within which the phenomenon of inconsistency between overt verbal and non-verbal Rs may be examined.

2. In testing hypothesis B it was found that the n Achievement scores obtained by Ss were not significantly related to the Ss subsequent cheating or non-cheating Rs. Thus, n Achievement scores did not function as predictors of cheating or non-cheating behavior. This suggests that the achievement motive, i.e., competition with a standard of excellence, does not predispose an individual to either cheat or not cheat. Further examination, however, of factors related to the n Achievement measure may provide some clarification of this finding. First, research (Lowell, 1950) has demonstrated that the n Achievement measure is particularly sensitive to stimulation conditions preceding the testing session. It was not feasible in this study to control each Ss environment prior to the testing situation; consequently, scores obtained by Ss may have been affected by the varying conditions which existed prior to the n Achievement assessment. A second important factor regarding the n Achievement phenomenon is that the preponderance of data collected has focused on male Ss. The factors involved in women's Rs to the n Achievement measure have not been as clearly defined nor as thoroughly researched as the factors involved in men's Rs (Atkinson, 1958). The Ss utilized in

the present study were predominantly women due to the high proportion of females taking Education 110 at the University of Maryland.

3. The results from testing hypothesis C demonstrated that the number of errors which Ss made on the statistics examination discriminated between the two groups of Ss, i.e., between cheaters and non-cheaters. The Ss in the group which exhibited cheating behavior made a significantly greater number of errors on the statistics examination than those who did not exhibit cheating behavior. This finding supports the position maintained by Hartshorne and May (1930) in their early study regarding honest and deceptive behavior. They concluded that overt behavior responses were situationally determined and that knowledge of conduct in one type of setting was not predictive of subsequent specific Rs in a wide range of situations. Carr and Roberts (1965) in a more recent study utilizing a phenomenon other than deceptive behavior established similar findings. They concluded that the crucial determinants of Rs are immediate "contextual field" conditions. The data in the present study support this conclusion.

4. In testing hypothesis D of the study it was determined that grades in a course and cheating or non-cheating behavior were not related. A Ss grade in Education 110 was found not to be predictive of cheating or non-cheating Rs. This result, however, warrants further examination. The grades given to Ss in the sample were

predominantly A's and B's; no D's or F's were given. It appears justifiable to posit that grades given in Education 110 do not clearly demonstrate the possible range of differences among students. This factor may have affected the results obtained in the present study regarding the relationship between grades and cheating or non-cheating behavior.

5. The testing of hypothesis E demonstrated that there were no differences in cheating or non-cheating type Rs made by Ss who scored above or below the median on an attitude measure. This finding parallels and adds further support to conclusion number one, i.e., differences in verbal attitude Rs are not related to subsequent overt behavior. In terms of Doob's theoretical model, the mediators of Rs appear to function differently when a verbal R is required than when a non-verbal R is required.

6. In testing hypothesis F no differences were found in cheating or non-cheating behavior among Ss who scored above or below the median on the n Achievement measure. This finding lends further support to the conclusion stated in number two of this section, i.e., concern over competition with a standard of excellence as measured by a projective type technique does not predispose an individual to make cheating or non-cheating type Rs. Research (McClelland, 1958; Litwin, 1958; Atkinson and Litwin, 1960) has demonstrated that both children and adults with high n Achievement seem to take moderate risks more readily than

those individuals with low n Achievement. The low n Achievement Ss exhibit either very safe or very speculative behavior. In one of the experimental sessions of this study Ss were allowed to score their own examination papers. Precautions were taken by the writer to minimize the amount of risk involved in making a cheating type R; however, it is not tenable to provide an accurate statement of the degree of risk perceived by Ss in the classroom. Consequently, it is impossible to determine whether the actual experimental conditions were perceived by the Ss as being very unsafe or as involving only moderate risk. The variable of "risk" may have affected the cheating Rs made by Ss in this study; consequently, the relationship between the strength of the achievement motive and cheating and non-cheating behavior may have been masked. Also, research (Atkinson, 1953; French, 1955; and Atkinson and Raphelson, 1956) has indicated that when expectancies of attaining several different types of incentives are equally salient in a given situation: the determination of the motivating factor becomes difficult to delineate. In the experimental session in this study, it appeared that the variable eliciting a cheating R was not the need to satisfy the achievement related motive. A possible implication of this study is that other motives or combinations of motives such as need, affiliation or power were predisposing the individual to respond.

Limitations of the Study

There were limitations in certain aspects of this study which need clarification. These limitations will be discussed in this section.

The attitude measure developed by the writer did not allow the Ss to make the culturally accepted response regarding cheating behavior, i.e., it did not provide the alternative of a non-cheating R. The forced-choice situation utilized elicited anxious and/or hostile behavior from the Ss during the testing session. In the pilot study when the alternative "cheat on no answers" was provided the majority of Ss chose that response; consequently, the range of scores was inadequate. These problems encountered in the pilot study and in the subsequent development of the attitude measure may have ultimately affected the scope of the present study, however, it should be recognized that when the culturally acceptable R was offered as an alternative the attitude measure itself did not discriminate among Ss in regard to attitude Rs toward cheating and non-cheating behavior.

The sample of cheating behavior used in this study was obtained in one of the three experimental sessions. It should be specified, however, that cheating behavior over a period of time may be a more precise index of cheating behavior than a R made in a single situation. This may in part account for the absence of a relationship between specific variables examined in the present study.

The n Achievement instrument as a measure of achievement motive also posed some limitations for the present study. It has been indicated previously that the n Achievement instrument is sensitive to stimulation conditions preceding the testing session. In the university setting the experimenter could not control the conditions prior to the experimental situation.

Another factor relevant to the n Achievement phenomenon is the difference which appears to exist between the motivational components of the achievement related behavior of female and male Ss. As has been previously indicated in this chapter, women's Rs to the n Achievement measure have not been as thoroughly researched as men's Rs. This factor, however, could not be controlled in the present study because the classes available for collecting data were composed principally of female students.

Implications for Further Research

Data presented in this study lend support to the hypothesis that overt verbal attitude Rs are not related to subsequent non-verbal Rs. Cheating and non-cheating Rs were focused upon to test the hypothesis. A replication of the present study utilizing a different index of cheating behavior could prove fruitful. Assessment of cheating behavior over an extended period of time might be more representative of a tendency to make cheating-type Rs than one measure of cheating behavior obtained in a single experimental session.

In order to circumvent the problem encountered when utilizing female Ss with the n Achievement measure, it might be illuminating to replicate the present study using only male Ss. This could provide additional clarification of the relationship between verbal attitude Rs, n Achievement and cheating and non-cheating behavior.

Since the data obtained in this study support the hypothesis that the crucial determinants of Rs are immediate relevant situational variables, perhaps phenomena other than grades and the number of errors on the exam should be examined. For example, the following factors could be manipulated; the professor's presence or absence when the opportunity for cheating is provided; the type of exam given; and the difficulty of the exam.

It appears that further investigation is necessary in order to delineate what personality variables predispose an individual to make cheating or non-cheating type Rs. If a study were designed to measure such factors as level of anxiety, intraversion, extraversion, affiliation motive, or power motive in relationship to cheating or non-cheating behavior; then, further clarification of the complex interrelationship between personality dynamics and overt behavior would occur.

Summary

The purpose of this study was to investigate the relationship between overt verbal attitude responses of

college students toward cheating behavior, achievement needs, and cheating behavior on test items. A further purpose of this study was to determine the relationship between grades and/or the number of errors made on an exam and cheating or non-cheating behavior. A selected review of related research was presented. The focus was upon three separate phenomena--attitudes, motives and cheating behavior.

The sample was comprised of sixty-six Ss--thirty-three cheaters and thirty-three non-cheaters. A stratified random sample was drawn from 184 students in six sections of Education 110 classes at the University of Maryland. The cheaters were matched with a group of non-cheaters by sex and class.

The data was obtained in three separate experimental sessions. During the first session a 35 item multiple-response attitude measure was administered to the subjects during the usual class period. Attitude toward cheating in a college setting was assessed utilizing an instrument developed by the writer in a pilot study. The second experimental session occurred one week after the presentation of the attitude measure. The McClelland n Achievement measure was administered using a set of four TAT-type pictures used to elicit imaginative stories which could be scored for the presence or absence of achievement related imagery. The third experimental session occurred two weeks after the administration of the n Achievement measure. During the third session the professor was absent from class by prior

arrangement. The writer presented a twenty minute taped lecture which focused upon elementary statistical concepts. Immediately following the taped lecture the Ss were administered a 30 item multiple-response test. Ss were provided with an opportunity to exhibit cheating behavior in a classroom setting while correcting their own examination papers after a copy of their original Rs was surreptitiously recorded.

Six hypotheses were formulated and tested. These were as follows:

1. There are no differences in verbal attitude Rs toward cheating behavior between Ss who exhibit cheating behavior and those who do not.

2. There are differences in achievement needs between Ss who exhibit cheating behavior and those who do not.

3. There are differences in the number of errors made by Ss who exhibit cheating behavior and those who do not.

4. There are no differences in grades between Ss who exhibit cheating behavior and those who do not.

5. There are no differences in cheating and non-cheating behavior between Ss who score high and low on a verbal (written) measure of attitudes toward cheating.

6. There are differences in cheating and non-cheating behavior between Ss with high and low need achievement scores.

The results of the study indicated that an individual's verbalization of an attitude may be either congruent or incongruent with his subsequent behavior. It was also found that n Achievement scores were not related to cheating or non-cheating type Rs. This suggested that the achievement motive, i.e., competition with a standard of excellence does not predispose an individual to either cheat or not cheat in a college classroom situation. The number of errors which a S made on the statistics examination was related to cheating behavior, i.e., Ss who cheated made a significantly greater number of errors than Ss who did not cheat. Grades in the course, however, were not related to cheating or non-cheating behavior.

APPENDIX A

PAIR COMPARISON MEASURE

Research indicates that students involve themselves in various types of deceptive behavior. Below are listed various phrases indicating examples of possible types of deceptive behavior. Undoubtedly, there are alternatives which would seem better to you than any listed here, however, circle the letter on the answer sheet which best expresses "you" given only two alternatives. Select one of the two alternatives for each number. Thank you for your cooperation.

- | | | |
|----|---|---|
| 1. | A. during an exam allow others to copy from your exam | B. during an exam copy answers from others near you |
| 2. | A. hand in someone's old term paper for your course | B. allow someone to hand in your old term paper |
| 3. | A. discuss questions on a take home exam even though you were instructed not to do so | B. insert answers in a blue book before taking an exam |
| 4. | A. discover a clever method of concealing information--utilize it during an exam | B. while correcting your own exam secretly change wrong answers |
| 5. | A. while correcting someone's exam secretly change wrong answers | B. during an exam allow others to copy from your exam |
| 6. | A. allow someone to hand in your old term paper | B. during an exam copy answers from others near you |
| 7. | A. insert answers in a blue book before taking an exam | B. hand in someone's old term paper for your course |
| 8. | A. while correcting your own exam secretly change wrong answers | B. discuss questions on a take home exam even though you were instructed not to do so |

9. A. during an exam allow others to copy from your exam
B. discover a clever method of concealing information--utilize it during an exam
10. A. during an exam copy answers from others near you
B. while correcting someone's exam secretly change wrong answers
11. A. allow someone to hand in your old term paper
B. insert answers in a blue book before taking an exam
12. A. hand in someone's old term paper for your course
B. while correcting your own exam secretly change wrong answers
13. A. discuss questions on a take home exam even though you were instructed not to do so
B. during an exam allow others to copy from your exam
14. A. discover a clever method of concealing information--utilize it during an exam
B. during an exam copy answers from others near you
15. A. while correcting someone's exam secretly change wrong answers
B. allow someone to hand in your old term paper
16. A. while correcting your own exam secretly change wrong answers
B. insert answers in a blue book before taking an exam
17. A. during an exam allow others to copy from your exam
B. hand in someone's old term paper for your course
18. A. during an exam copy answers from others near you
B. discuss questions on a take home exam even though you were instructed not to do so
19. A. allow someone to hand in your old term paper
B. discover a clever method of concealing information--utilize it during an exam
20. A. insert answers in a blue book before taking an exam
B. while correcting someone's exam secretly change wrong answers

21. A. while correcting your own exam secretly change wrong answers
B. during an exam allow others to copy from your exam
22. A. hand in someone's old term paper for your course
B. during an exam copy answers from others near you
23. A. discuss questions on a take home exam even though you were instructed not to do so
B. allow someone to hand in your old term paper
24. A. discover a clever method of concealing information--utilize it during an exam
B. insert answers in a blue book before taking an exam
25. A. while correcting someone's exam secretly change wrong answers
B. while correcting your own exam secretly change wrong answers
26. A. during an exam allow others to copy from your exam
B. allow someone to hand in your old term paper
27. A. discuss questions on a take home exam even though you were instructed not to do so
B. hand in someone's old term paper for your course
28. A. discover a clever method of concealing information--utilize it during an exam
B. while correcting someone's exam secretly change wrong answers
29. A. during an exam copy answers from others near you
B. while correcting your own exam secretly change wrong answers
30. A. insert answers in a blue book before taking an exam
B. during an exam allow others to copy from your exam
31. A. hand in someone's old term paper for your course
B. discover a clever method of concealing information--utilize it during an exam
32. A. while correcting someone's exam secretly change wrong answers
B. discuss questions on a take home exam even though you were instructed not to do so

33. A. allow someone to hand in your old term paper
- B. while correcting your own exam secretly change wrong answers
34. A. during an exam copy answers from others near you
- B. insert answers in a blue book before taking an exam
35. A. discover a clever method of concealing information--utilize it during an exam
- B. discuss questions on a take home exam even though you were instructed to not do so
36. A. hand in someone's old term paper for your course
- B. while correcting someone's exam secretly change wrong answers

APPENDIX B

ATTITUDE MEASURE

This is an investigation into the dynamics involved in the classroom situation. It represents an attempt to explore "how" the University student is thinking and feeling. Research clearly indicates that students involve themselves in various types of deceptive behavior. Below are listed a number of classroom situations in which a student is faced with various alternatives. In each case imagine that you are really faced with the choices presented. There will undoubtedly be alternatives which will seem better to you than any of those listed, however, choose the answer which seems to express "you" under the given circumstances. Mark your choice on the separate answer sheet. Thank you for your cooperation.

1. The content of a course is generally meager and uninteresting. It is a required course in your major field. In this situation would you:
 - a. insert answers in a blue book before taking an exam
 - b. while correcting your own exam secretly change wrong answers
 - c. while correcting someone's exam secretly change wrong answers
 - d. allow someone to hand in your old term paper

2. As a teacher the professor is generally poor. His tests are extremely difficult and based on senseless detail. In this situation would you:
 - a. discuss questions on a take home exam even though you were instructed not to do so
 - b. hand in someone's old term paper for your course
 - c. while correcting someone's exam secretly change wrong answers
 - d. while correcting your own exam secretly change wrong answers

3. The professor of a course is well-known in his field and obviously more interested in publishing than in teaching. He frequently returns assignments with unwarranted caustic remarks. In this situation would you:
 - a. insert answers in a blue book before taking an exam
 - b. while correcting your own exam secretly change wrong answers

- c. while correcting someone's exam secretly change wrong answers
 - d. allow someone to hand in your old term paper
4. As a teacher the professor is generally good. The class is very large and the professor leaves the room during tests, returning at the end to collect the papers. In this situation would you:
- a. discuss questions on a take home exam even though you were instructed not to do so
 - b. hand in someone's old term paper for your course
 - c. allow others to copy from your exam
 - d. copy answers from others near you during an exam
5. The content of a course is of minimal interest. As a teacher the professor is usually interesting, however, he frequently misses class. Written assignments are seldom returned. In this situation would you:
- a. discover a clever method of concealing information--utilize it during an exam
 - b. while correcting someone's exam secretly change wrong answers
 - c. hand in someone's old term paper for your course
 - d. copy answers from others near you during an exam
6. The teacher is an inexperienced graduate assistant. It is quite apparent that he is more interested in his doctoral dissertation than in teaching undergraduates. In this situation would you:
- a. while correcting someone's exam secretly change wrong answers
 - b. allow others to copy from your exam
 - c. discuss questions on a take home exam even though you were instructed not to do so
 - d. copy answers from others near you during an exam
7. The content of a course is new and interesting; it is required in your minor field. The class is very small. In this situation would you:
- a. discuss questions on a take home exam even though you were instructed not to do so
 - b. while correcting someone's exam secretly change wrong answers
 - c. insert answers in a blue book before taking an exam
 - d. allow someone to hand in your old term paper
8. The professor is old and his lectures dull. The tests are easy but meaningless. In this situation would you:
- a. discover a clever method of concealing information--utilize it during an exam
 - b. allow someone to hand in your old term paper

- c. while correcting someone's exam secretly change wrong answers
 - d. copy answers from others near you during an exam
9. The course is a general University requirement. A "reader" is used for correcting and grading all exams. In this situation would you:
- a. discuss questions on a take home exam even though you were instructed not to do so
 - b. hand in someone's old term paper for your course
 - c. copy answers from others near you during an exam
 - d. discover a clever method of concealing information--utilize it during an exam
10. The course is an elective. The tests are hard but sensible and meaningful. In this situation would you:
- a. while correcting your own exam secretly change wrong answers
 - b. allow others to copy from your exam
 - c. insert answers in a blue book before taking an exam
 - d. copy answers from others near you during an exam
11. As a teacher the professor is highly respected. He takes a genuine interest in his students. Assignments are always returned promptly with helpful remarks. In this situation would you:
- a. allow someone to hand in your old term paper
 - b. copy answers from others near you during an exam
 - c. while correcting your own exam secretly change wrong answers
 - d. insert answers in a blue book before taking an exam
12. The content of a course is generally new and interesting. The professor frequently comes late to class and expects the class to always wait for him. He often gives "pop" quizzes and his exams are based on senseless detail. In this situation would you:
- a. insert answers in a blue book before taking an exam
 - b. hand in someone's old term paper for your course
 - c. discover a clever method of concealing information--utilize it during an exam
 - d. while correcting someone's exam secretly change wrong answers
13. As a teacher the professor is poor. His assignments are always unclear and vague. In this situation would you:
- a. while correcting someone's exam secretly change wrong answers
 - b. discover a clever method of concealing information--utilize it during an exam

- c. allow someone to hand in your old term paper
 - d. hand in someone's old term paper for your course
14. The tests in a course are easy but sensible and meaningful. The professor stays in the room during tests reading and looking around the room.
In this situation would you:
- a. insert answers in a blue book before taking an exam
 - b. discover a clever method of concealing information--utilize it during an exam
 - c. while correcting someone's exam secretly change wrong answers
 - d. hand in someone's old term paper for your course
15. The course is an elective and to your surprise it is both interesting and challenging. The exams, however, are hard and based on senseless detail.
In this situation would you:
- a. hand in someone's old term paper for your course
 - b. allow someone to hand in your old term paper
 - c. copy answers from others near you during an exam
 - d. discuss questions on a take home exam even though you were instructed not to do so
16. As a teacher you find the professor distasteful. He has unpleasant mannerisms and expresses views which frequently offend you as a person.
In this situation would you:
- a. hand in someone's old term paper for your course
 - b. discover a clever method of concealing information--utilize it during an exam
 - c. copy answers from others near you during an exam
 - d. allow others to copy from your exam
17. The course is a general university requirement. The professor is obviously bored with the material. During tests he leaves the room, returning at the end to collect the papers.
In this situation would you:
- a. while correcting someone's exam secretly change wrong answers
 - b. while correcting your own exam secretly change wrong answers
 - c. hand in someone's old term paper for your course
 - d. insert answers in a blue book before taking an exam
18. The content of the course is generally interesting. The tests are hard but meaningful. You are aware that many students are copying or using crib sheets during testing sessions.
In this situation would you:

- a. while correcting your own exam secretly change wrong answers
 - b. allow someone to hand in your old term paper
 - c. hand in someone's old term paper for your course
 - d. copy answers from others near you during an exam
19. The content of a course, in your major field, is meager and uninteresting. The class is quite large, nevertheless, the professor makes every attempt to make the dull material more palatable.
In this situation would you:
- a. discuss questions on a take home exam even though you were instructed not to do so
 - b. hand in someone's old term paper for your course
 - c. copy answers from others near you during an exam
 - d. while correcting your own exam secretly change wrong answers
20. As a teacher the professor is unusually good. The class is small and each class session includes a stimulating discussion period. The professor leaves the room during tests, returning at the end to collect the papers.
In this situation would you:
- a. insert answers in a blue book before taking an exam
 - b. discover a clever method of concealing information--utilize it during an exam
 - c. while correcting someone's exam secretly change wrong answers
 - d. allow someone to hand in your old term paper
21. The content of a course is new and interesting. During class discussions, however, the professor continually makes unnecessary sarcastic remarks in regard to the students' responses.
In this situation would you:
- a. while correcting someone's exam secretly change wrong answers
 - b. while correcting your own exam secretly change wrong answers
 - c. hand in someone's old term paper
 - d. discover a clever method of concealing information--utilize it during an exam
22. The content of a course is meager and uninteresting. The professor always uses a class "curve" when grading the exams.
In this situation would you:
- a. allow others to copy from your exam
 - b. hand in someone's old term paper for your course
 - c. allow someone to hand in your old term paper
 - d. while correcting someone's exam secretly change wrong answers

23. The class is large and the course a general university requirement. The professor announces at the beginning of the semester that $1/3$ of the class will fail. In this situation would you:
- while correcting your own exam secretly change wrong answers
 - allow someone to hand in your old term paper
 - while correcting someone's exam secretly change wrong answers
 - discover a clever method of concealing information--utilize it during an exam
24. The content of a course is generally new and interesting. The tests are hard and based on senseless detail. The professor grades on a strict percentage basis. In this situation would you:
- allow someone to hand in your old term paper
 - discuss questions on a take home exam even though you were instructed not to do so
 - while correcting your exam secretly change wrong answers
 - allow others to copy from your exam
25. The professor never lectures or actually presents material. He leads discussions that often seem quite irrelevant to the course content. The tests are hard and based on senseless detail. In this situation would you:
- while correcting your own exam secretly change wrong answers
 - discuss questions on a take home exam even though you were instructed not to do so
 - insert answers in a blue book before taking an exam
 - allow others to copy from your exam
26. As a teacher the professor is excellent. A graduate assistant always administers the tests. He remains in the room during the tests reading and occasionally looking around the room. In this situation would you:
- allow others to copy from your exam
 - hand in someone's old term paper for your course
 - while correcting your own exam secretly change wrong answers
 - discover a clever method of concealing information--utilize it during an exam
27. The professor announces that final grades will be based on the results of a mid-term exam, and a final. The class is large. In this situation would you:

- a. copy answers from others near you during an exam
 - b. insert answers in a blue book before taking an exam
 - c. allow others to copy from your exam
 - d. hand in someone's old term paper for your course
28. The content of a course is generally interesting. As a teacher the professor is good, however, he always fails to announce when exams will be given.
In this situation would you:
- a. while correcting someone's exam secretly change wrong answers
 - b. allow others to copy from your exam
 - c. while correcting your own exam secretly change wrong answers
 - d. copy answers from others near you during an exam
29. The professor is an interesting lecturer, but continually assigns meaningless "busy work". The tests are hard but based on senseless detail.
In this situation would you:
- a. allow someone to hand in your old term paper
 - b. hand in someone's old term paper for your course
 - c. copy answers from others near you during an exam
 - d. while correcting your own exam secretly change wrong answers
30. As a teacher, the professor seems unnecessarily demanding in regard to the amount of required reading. He gives many assignments of which only a few are returned. The tests are hard.
In this situation would you:
- a. discuss questions on a take home exam even though you were instructed not to do so
 - b. while correcting your own exam secretly change wrong answers
 - c. insert answers in a blue book before taking an exam
 - d. allow someone to hand in your old term paper

APPENDIX C

SET OF TAT-TYPE PICTURES

Below are listed the descriptions of the four TAT-type pictures used to elicit achievement related stories. The identifying numbers (1-82) were taken from McClelland's catalog of pictures (Atkinson, 1958, 831). The descriptive title of each picture is stated below and is followed by the source of each picture. The pictures were presented in the following order:

1. Father-son. Picture A of the original n Achievement series.
Source: Card 7 BM from TAT (Murray, 1956).
2. Two men ("inventors") in a shop working at a machine. Picture B of the original n Achievement series.
Source: McClelland (1953, 100).
7. Boy with vague operation scene in background. Picture G of the original n Achievement series.
Source: Card 8 BM from TAT (Murray, 1956).
8. Boy in checked shirt at a desk, an open book in front of him. Picture H of original n Achievement series.
Source: McClelland (1953, 100).

(Atkinson, 1958, 832-833)

APPENDIX D

GUIDE QUESTIONS FOR WRITING RESPONSES TO PICTURES

1. What is happening? Who are the persons?
2. What has led up to this situation? That is, what has happened in the past?
3. What is being thought? What is wanted? By whom?
4. What will happen? What will be done?

APPENDIX E

INSTRUCTIONS FOR N ACHIEVEMENT MEASURE

This is a test of your creative imagination. A number of pictures will be projected on the screen before you. You will have twenty seconds to look at the picture and then about four minutes to make up a story about it. Notice that there is one page for each picture. The same four questions are asked. They will guide your thinking and enable you to cover all the elements of a plot in the time allotted. Plan to spend about a minute on each question. I will keep time and tell you when it is about time to go on to the next question for each story. You will have a little time to finish your story before the next picture is shown.

Obviously there are no right or wrong answers, so you may feel free to make up any kind of a story about the pictures that you choose. Try to make them vivid and dramatic, for this is a test of creative imagination. Do not merely describe the picture you see. Tell a story about it. Work as fast as you can in order to finish in time. Make them interesting. Are there any questions? If you need more space for any question, use the reverse side.

APPENDIX F

TEXT OF STATISTICS LECTURE

This lecture is one in a series concerned with the elementary treatment of experimental data in education and related disciplines. Data resulting from an experiment are usually a collection of observations or measurements from which conclusions are drawn. These conclusions cannot be reliably determined by the direct method of inspection of data. Statistics provides the methodology whereby classification, description, and rules of evidence for the drawing of valid inferences, can be related.

A knowledge of statistics is an essential part of the training of all students in education. There are many reasons for this. First, in order to understand contemporary literature in education and such related disciplines as psychology and sociology a knowledge of statistical method and modes of thought is necessary. A rather high proportion of current books and journal articles either report experimental findings in statistical form or present theories or arguments involving statistical concepts. These concepts play an increasing role in our thinking about educational problems, quite apart from the actual treatment of data. You need only consider, for a moment, the role of statistical concepts in current theorizing in the field of learning and you will recognize the significance of a statistical orientation. Furthermore, training in statistics is training in the scientific method. Statistical inference is scientific inference, which in turn is inductive inference--the making of general statements from specific incidents. These terms for all practical purposes, are synonymous. Statistics is an attempt to make induction rigorous. Some scholars regard induction as the only way in which new knowledge comes into being. This statement is obviously open to some question, however, the role of induction in modern scientific discovery is of the greatest importance. For these reasons no serious student of education can afford not to know something of the rudiments of the scientific approach to problems of which statistical procedures play an important role.

As has been stated, the special branch of mathematics entitled statistics provides a logical analysis of the problem of drawing conclusions from incomplete evidence. From the study of statistics, one learns that inferences

can be made most easily when the evidence is collected and summarized according to established clear-cut rules. This lecture will introduce some of the basic concepts upon which the rules of statistical inference depend. To begin with, the differences between a sample and a population will be pointed out in order to demonstrate more clearly the reason why statistical methods must be used for certain inferences.

If you wished to make an investigation concerning the intelligence level of college students in the United States, you might undertake to obtain the IQ score of every individual enrolled in a college in the country. This set of scores would be a complete or exhaustive set of observations relevant to your investigation. With such a complete set of observations, you could make certain statements about college students' IQs with perfect confidence. For example, you could make an exact statement about the range of variation or about the average of all US college students' IQs in that particular year (or moment) of investigation.

However, it is very rare to have the entire set of relevant observations available in a practical investigation. Usually it is not convenient to collect more than a small part of the relevant observations. The entire set of relevant observations is called a **POPULATION**; that part of the set which is available is called a **SAMPLE**. As soon as you have to deal with a sample instead of with the entire population of observations, you must begin to use the methods of statistics.

In ordinary usage, such as the phrase "population of the United States" or even "vital statistics on the U. S. population," the word "population" refers to an aggregate whose individual members are persons. In technical usage, however, a population is an aggregate of observations. In some cases, these observations are characteristics of persons, such as heights, incomes, number of children, and the like, but even in such cases, the population under consideration in statistics does not consist of the actual persons themselves but only of the observations about some particular characteristic of these persons.

Students of government and economics talk about "population statistics," meaning the description of characteristics of a population of persons living in a particular geographical area. But the special concept of population in statistics--as a branch of applied mathematics--never refers to actual people but to observations. These observations are usually stated in the form of numbers, and the members of a statistical population are these numbers.

The IQs of all college students would constitute a population of numerical observations. Such an aggregate

can be spoken of even though not all students have taken IQ tests. A set of observations drawn from a population is called a SAMPLE. A limited number of college students' IQs would be a sample of these numerical observations.

For example, there are 27 persons living in a particular apartment house. A social psychologist chooses every third person in the house for a study of attitudes, and he obtains a questionnaire score from each person chosen. In this example, the members of the statistical population are not persons but scores. The number of (potential) members of the population is 27, even though not all of them are actually obtained. The concept of a population of observations applies to all the observations of a particular sort which might be obtained. It is not necessary that all the scores actually be obtained in order to talk about the population. The number of members in the sample of questionnaire scores is nine.

In emotion-provoking situations, a laboratory rat usually does some squealing. One way to measure the rat's general nervousness or emotionality is to count the number of squeals. Since the rat cannot be observed all the time, the entire population of observations of squealing cannot be available; only a sample can be obtained.

The selection of a sample is called "drawing a sample." When samples are used, the investigator's interest is not in the sample for its own sake but in the population from which it has been drawn. The investigator may be interested in making inferences about the characteristics of the population. Statements about the characteristics of a population are called DESCRIPTIVE statements. For example, one may wish to make a descriptive statement about the emotionality of a certain genetic strain of rats when he has observed only a few rats of that strain and when, in fact, he has observed only a sample of the squealing behavior even of these few.

One may wish to make a descriptive statement about a person's level of intelligence on the basis of only a sample of the person's behavior in taking intelligence tests. Or one may wish to make a descriptive statement about the average IQ of U. S. college students when, in fact, he has the IQ scores of only a limited number of college students available to him. Very frequently, however, the investigator primarily wants to know whether two populations are different from each other. If he has drawn samples of squealing behavior from two different strains of rats, he may want to know whether one strain is more emotional than the other. He must use his samples to determine whether the populations of squealing behavior from which

they are drawn are different. In such a case, the inference made from the samples is an inference about the existence of differences. The investigator, for the moment, cares little about describing the degree of emotionality of each strain. What he does care about is the question "Does heredity make a difference in emotionality?" To answer this question, he must determine whether his samples indicate that a difference exists between the two populations of squealing behavior.

In laboratory experiments, an investigator often begins by setting up different conditions for two groups of subjects. Then he must be able to determine whether the observations indicate that the two groups are actually different from each other.

The need for statistical methods of inference arises only when the available observations are limited to a sample drawn from the entire population. It is easy to show that a descriptive statement about a whole population could not be made from a sample without special methods of inference. Different samples from the same population are not apt to be exactly alike; it would not be wise to assume, therefore, that the population is exactly like any one of the samples.

Since characteristics of the population are likely to differ from those of samples, two different words are used for "characteristics." It is customary to talk about the population characteristics as population PARAMETERS and to talk about the sample characteristics as sample STATISTICS. Special statistical techniques have been developed to permit the inference of population parameters from sample statistics.

Suppose you are interested in knowing whether there is a difference in the heights of two individuals. You measure them both, and you find that one is $\frac{1}{4}$ inch taller than the other. You might check your observations by making the measurements a second time, but if you got the same result again, you would not hesitate to report that there is a genuine difference between their heights, although a small one. However, if you found that the mean height of a sample of students from Alpha College was $\frac{1}{4}$ inch greater than the mean height of an Omega College sample, you might hesitate to conclude that Alpha College students tend to be taller than Omega students. Such a small amount of difference might tend to disappear (or even to reverse itself) if you were to draw a second sample from each college population. The greater certainty of the comparison between heights of individuals arises because all the relevant observations are available. Doubt about the difference between populations emerges when only a limited number of the relevant observations are available. Within the population

of height measurements at Alpha College, there will be a great deal of variation among individual students. In fact, there is likely to be more variation within either one of these populations than there is between the two college populations.

The variability between samples drawn from the same population is called **SAMPLING VARIABILITY**. This variability is due to the accidental factors which determine the selection of observations included in the samples.

Small differences between sets of observations may be due only to chance, in other words, to the accidental factors which determine the selection of observations included in the samples. These small differences may be due to sampling variability. Small differences between sets of observations, if they are due to sampling variability, probably do not signify that the samples were drawn from populations that are different from one another. But if two samples come from different populations, there will be two sources of differences between the samples. There will still be sampling variability, producing some of the small differences between the samples. But there will also be a second source of differences: the fact that the populations from which the samples are drawn are themselves different from each other. These two sources of difference are likely to produce a greater total amount of difference than the first source alone. When two samples have been drawn from different populations, the differences between these samples are likely to be greater than the differences between samples from the same population. If the difference between the sets of observations is very large, it probably signifies that the two sets do not belong to the same population. Such a large difference is called a **SIGNIFICANT DIFFERENCE** because it signifies that a difference exists between the two populations.

Suppose that the difference between the Alpha and Omega College height samples is very small, too small to be considered a significant difference. One would infer, then, that the small difference is really due to sampling variability and that, as far as height is concerned, Alpha and Omega college students belong to the same population.

An intelligence-test score for one individual is not like a height measurement, because the intelligence-test score represents a sample of the intelligence-test-taking behavior of that person. If another comparable test were given to the same person, a somewhat different score might be obtained simply because of sampling variability. There is no question about the significance of a difference in heights between two individuals, but such a question ought

to be raised about an apparent difference in their IQs. Unless the difference in IQ is sufficiently large, it may be due to sampling variability alone.

When we compare two persons' IQ scores, we want to know whether the one score differs from the other more than two different IQ scores from the same person would be likely to differ from each other. We are, in fact, asking whether the population of intelligence-test-taking behavior of one of the two persons is distinguishably different from the population of intelligence-test-taking behavior of the other person. Even if the populations of such behavior for the two persons are quite similar, the IQ scores as obtained on particular occasions might be somewhat different. This result would appear, for example, if one of the persons had been very tired during the test.

The question about significance of differences arises whenever the observations under consideration make up only a sample of the relevant observations instead of including the entire population. It arises in the comparison of IQ scores of two individuals, even though the IQ score is a single number, because the IQ score really arises from a sample of observations drawn from a much larger population of relevant observations.

Summary

In summary, then, the word "population" in statistics refers to an aggregate of observations and not to a group of persons. If only part of the population is actually available for study, we can learn about the population only from this sample. Whenever an entire population of observations is not available for study, there will be a need for statistical methods in order to draw inferences from any available sample. Inferences made about the population characteristics result from inferring population parameters from the sample statistics. A difference which is large enough to permit the conclusion "These samples come from different populations" is called a significant difference. A "significant" difference signifies that two samples probably came from different populations.

APPENDIX G

STATISTICS TEST

1. The word "population" as used in statistics refers to:
 - a. an aggregate of observations
 - b. an aggregate of people
 - c. a sample
 - d. a score

2. What do the IQ scores of all the students in Alpha College comprise with respect to questions about IQs in any College?
 - a. an aggregate of observations
 - b. an aggregate of people
 - c. a sample
 - d. a population

3. Any one IQ score is a result of a series of observations with respect to questions about the intelligence-test-taking behavior of that person. This IQ score is called:
 - a. an observation
 - b. a sample
 - c. a statistic
 - d. an inference

4. A limited number of observations made on the same individual constitutes:
 - a. a sample of all the observations that might be made on that individual
 - b. a population
 - c. an inadequate sample of some observations of that individual
 - d. a score

5. Squealing behavior by a rat is emitted in emotion-provoking situations. A count of the number of squeals the rat emits is called:
 - a. a population
 - b. a number of observations
 - c. an inadequate sample of observations
 - d. a statistical inference

6. If you require a group of children to memorize 100 spelling words and you decide to test them on 75 words, the number of members in the population of relevant observations is:

- a. 75
 - b. a statistic
 - c. 100
 - d. an inadequate sample
7. Statistics attempts to:
- a. make education more scientific
 - b. make mathematics more scientific
 - c. alleviate classification and descriptive errors
 - d. make induction rigorous
8. An exhaustive set of observations on one variable concerning Omega College students would allow you to do which of the following?
- a. make an exact statement about the range of variation of Omega College students on one variable
 - b. make a statement about the average range of variation of scores on several variables
 - c. to infer very little about Omega College students
 - d. to make statements about the average college student
9. "Population statistics" differs from "statistics" as a branch of applied mathematics in which of the following ways?
- a. "Population statistics" always refers to a geographical area
 - b. Population in statistics always refers to actual people
 - c. "Population statistics" refers to observations stated in the form of numbers deemed the statistical population
 - d. Population in statistics never refers to actual people
10. An entire set of relevant observations is usually:
- a. possible to obtain
 - b. a very rare phenomena
 - c. easily obtained
 - d. obtained because it is essential for making inferences
11. Statements about characteristics of a population are called:
- a. descriptive statements
 - b. inferences
 - c. data
 - d. parameters
12. An investigator wants to find out whether students learn French vocabulary words more quickly after sleep or late in the evening. In order to determine whether

- a time difference really affects ease of learning the investigator must first:
- a. obtain one set of observations on a population
 - b. obtain one set of observations on a sample
 - c. obtain two sets of observations on a few students
 - d. obtain two sets of observations on a sample
13. In order to determine whether two populations are different from each other on a particular variable an investigator must:
- a. draw an adequate sample of the specific behavior from both populations
 - b. draw a sample from one population
 - c. collect data relevant to the population
 - d. collect data about a sample
14. When a statement is made concerning the intelligence of an individual, it is a:
- a. classification of his behavior
 - b. sample
 - c. descriptive statement
 - d. population
15. Statements can be made about the intelligence of an individual from:
- a. observing him
 - b. a classification of his behavior
 - c. a valid reading test
 - d. a sample of his behavior in taking intelligence tests
16. If an entire population of observations is available for study, statistical inference is:
- a. not necessary
 - b. necessary
 - c. a method used to determine results
 - d. a method used to draw conclusions
17. Statistical methods of inference are utilized:
- a. whenever possible
 - b. when the available observations are limited to a sample of the population
 - c. when observations are limited to a population
 - d. when populations are exactly alike
18. Population characteristics are customarily called:
- a. statistics
 - b. parameters
 - c. inferences
 - d. statistical observations

19. If you discovered that the average or mean height of a sample of students from Alpha College was $\frac{1}{4}$ inch greater than the mean height of an Omega College sample, you might:
- conclude that chance is always a factor when differences appear
 - conclude that the difference was significant
 - hesitate to conclude that Alpha College students tend to be taller than Omega students
 - conclude that Alpha College students tend to be taller than Omega students
20. Within the population of height measurements at both Alpha College, and Omega College there will be a great deal of variation among individual students. In fact, there is likely to be:
- an average amount of variation within both populations
 - an average amount of variation between the two populations
 - less variation within either college population than there is between the two populations
 - more variation within either college population than there is between the two populations
21. Whether a sample is unusual or not can:
- be predicted easily
 - always be known in advance
 - never be known in advance
 - sometimes be known in advance
22. Samples drawn from the same population will:
- always be the same
 - have some amount of difference
 - always be very different
 - seldom have any differences
23. Sampling variability is due to:
- differences in the type of statistical technique utilized
 - differences in subjects
 - accidental factors which determine the selection of observations used in the sample
 - errors made by the investigator
24. If two samples come from the same population there will be:
- only one source of difference between the samples
 - two sources of difference between the samples
 - several sources of difference between the samples
 - no source of difference between the samples

25. When samples come from two different populations there will be:
- one source of difference between the samples
 - two sources of difference between samples
 - several sources of difference between samples
 - many sources of difference between samples
26. If the difference between the Alpha and Omega College height samples is very small, then:
- there may be a significant difference between the samples
 - the populations could be considered different
 - there probably is not a significant difference between the samples
 - the sample was not carefully drawn
27. If the difference between the Alpha and Omega College height samples are very large then:
- the difference may be attributed to sampling variability
 - the populations can be regarded as the same
 - one could conclude that there was a sampling error
 - one could conclude that the students at Alpha College had been drawn from a different population (with regard to height) from the students at Omega College
28. The difference between the average height of men and the average height of women is significant, therefore:
- it signifies that men and women belong to different populations with regard to height
 - it signifies that men are always taller than women
 - it signifies that men and women belong to the same populations with regard to height
 - the difference is due to sampling variability
29. When two samples have been drawn from different populations the differences between the samples are likely to be:
- smaller than the differences between samples from the same population
 - larger than the differences between samples from the same population
 - about the same
 - not significantly different
30. In a comparison of the batting ability of two players, the question of significance of the difference:
- does arise
 - does not arise
 - could arise
 - is not a relevant question

31. If the batting average of players is taken as an indicator of batting ability each average is the result of:
- chance factors
 - sampling variability
 - a set of observations which make up a sample
 - a set of observations which make up a population
32. If two students in a math class were compared on the basis of classroom test scores, the question of significance of difference:
- would arise
 - would not arise
 - would be a false assumption
 - is not a relevant issue
33. An intelligence-test score for one individual is:
- not like a height measurement because it represents a sample
 - like a height measurement because it represents a sample
 - about the same type of measurement as height
 - very useful for making specific inferences about the individual's ability
34. In comparing two groups in regard to IQ, the greater the difference in IQ scores:
- the greater the possibility that the samples are similar
 - the more significant the sampling variability
 - the greater the possibility that the populations are similar
 - the less likely the populations are similar
35. When the entire population of observations is not available:
- one can be sure that differences between samples implies a difference between the populations
 - one cannot be sure that differences between samples implies a difference between the populations
 - one can be somewhat sure that differences between samples implies a difference between the populations
 - one should not attempt to make statistical inferences

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