A STUDY OF MALE ACADEMIC ACHIEVEMENT MOTIVATION IN A SELF-ECONOMY CONTEXT

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ABSTRACT

A STUDY OF MALE ACADEMIC ACHIEVEMENT MOTIVATION IN A SELF-ECONOMY CONTEXT

Anthony John Guthrie

The study was concerned with the development and testing of a theory of academic achievement motivation, based on the self concept functioning in an elementary economic context. From this self economy theory hypotheses relative to differences among students at different grade point and motivation levels were deduced.

A one hundred and eighty one item instrument was selected from an item pool of five hundred eight items developed by Farquhar and associates at Michigan State University.[1] The selected items purported to measure differences among students inferred from eleven of the theoretically derived hypotheses. Four criterion groups of male students were statistically defined as differing on grade point level, motivation level, or both. Each of these groups consisted of thirty-five male eleventh grade students. All were chosen from the forty two hundred students originally selected for the Farquhar study. It was found that one hundred and sixty items significantly discriminated between at least one pair of these criterion groups.

The total instrument was divided into eleven characteristic scales each related inferentially to one of the eleven theory derived hypotheses. The mean score of each criterion group on each characteristic scale was compared with the mean score of each of the other three criterion groups. It was found that each of the eleven characteristic scales significantly differentiated between at least one pair of criterion groups. The mean scores of each criterion group on the total instrument was compared with the mean of each other group. It was found that the total instrument significantly discriminated between five of the six possible paired comparisons of criterion groups.

Analysis of variance (internal consistency) reliability estimates on the characteristic scales were made for each scale for each criterion group. On four characteristic scales these were of an acceptable magnitude (over .72), on five scales they were of a questionable magnitude (.39 to .72), and on two scales they were of so low a magnitude (-.08 to +.06) as to make interpretation of the characteristic scale impractical. The analysis of variance reliability estimate of the total instrument over all groups was .95.

It was found that the criterion group of students highest on grade level and high on motivation (High Over Achievers) was significantly different from each of the other three groups on the total instrument. Furthermore, these differences persisted on thirty two of the thirty three possible paired comparisons with each of the other three criterion groups on the eleven characteristic scales. The criterion group of students lowest on grade point level and low on motivation (Low Under Achievers) was significantly different from each of the other three criterion groups on the total instrument. This group was also significantly different on nineteen of the thirty three possible paired comparisons with each of the other criterion groups on the eleven characteristic scales.

No significant difference was found on the total instrument between the two criterion groups of students who were average on grade point level and different on motivation level (Low Over Achievers and High Under Achievers). On characteristic scale comparisons between these two criterion groups three of eleven tests were significant, one in the direction of the motivated group being higher and two in the direction of the non-motivated group being higher.

The theory developed for use in the study elicited twenty-three hypotheses of which eleven were tested on the criterion groups selected for the pilot research. Within the limits of the initial test success of theory was greatest relative to discrimination of students high on both grade point average and motivation (High Over Achievers). This group differed significantly on 32 of 33 tests of the eleven hypotheses when compared with each of the other three groups. The group of students low on both grade point average and motivation (Low Under Achievers) differed significantly on 19 of 33 paired comparisons. The two groups that differed only on motivation (High Under and Low Over Achievers) differed significantly on three of eleven comparisons made between them, two higher in the direction of the high motivated and one in the direction of the low motivated group. These results indicate greater effectiveness of theory in discriminating between groups that differ on grade point level and motivation than between groups differing only on motivation level. Greatest success of theory is indicated relative to discrimination of students high on grade point level and motivation

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[1]William W. Farquhar, A Comprehensive Study of the Motivational Factors Underlying Achievement of Eleventh Grade High School Students. Research Project No. 846 (8458); Supported by the United States Office of Education, in cooperation with Michigan State University, 1959.

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A STUDY OF MALE ACADEMIC ACHIEVEMENT MOTIVATION IN A SELF-ECONOMY CONTEXT

By

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A THESIS

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To My Mother

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CHAPTER I

FORMULATION AND DEFINITION OF THE PROBLEM

Need for the Study

Parents, teachers and educators are attempting to understand the many facets of academic achievement. Quantitatively, ever increasing amounts of money are being invested in education and an even more rapidly increasing number of students are availing themselves of educational opportunities. Qualitatively, progress is much slower. Many questions will confront the American educational system before qualitative development can keep pace with quantitative growth. The pivotal factor related to an increased quality of academic achievement is academic motivation. Why students do or do not achieve academically what they are capable of achieving based upon their academic potential is the most pressing of scholastic problems.

Many studies and much progress is being made in the discovery, definition and description of intellectual factors associated with academic achievement. Equivalent progress is not being made in the area of motivational factors. It is with this need in mind that the present study is directed to the basic question of academic achievement motivation.

Purpose of the Study

A satisfactory answer to the academic motivation problem will enable more effective analysis and prediction upon which can be based more accurate selection, placement and classification of students.

The analysis, study and application of variables found to be relevant to academic motivation will enable educators and prospective educators to better understand and cope with the significant factors affecting the achievement of their students. Concomitantly, the knowledge and understanding of these factors will enable the resources of the students' world to be mobilized and brought to bear upon his academic life to foster more nearly maximal academic achievement.

Background of the Study

Basic to research on academic motivation is the theory upon which the empirical aspects of the study rest. Review of the field of motivational theory produced the findings reported below which lead to a theory for the present study.

The problem of motivation, its definition, analysis and measurement, have plagued philosophers and psychologists from their first writings about man to the present. Gardner Lindzey states that, "No area of psychology has been subjected to a more prolonged and less systematic scrutiny than has the domain of motivation. . . . many distinguished psychologists have centered much of their attention upon this class of variables but with remarkably little in the way of tangible and widely accepted gain."[1] In 1951 the status of motivational psychology was evaluated by Koch[2] who came to the conclusion that it had not at that time reached a stage where it could even realistically aspire to a general systematic theory. In the ten years since Koch's evaluation the situation seems to have moved in directions other than toward synthesis or

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[1]Gardner Lindzey, Assessment of Human Motives (New York: Grove Press, Inc., 1960), p. 3.

[2]S. Koch, "The Current Status of Motivational Psychology," Psychological Review, Vol. 3, 1951, 147-154.

integration of theory. Currently, there exist a multitude of theories all of which illuminate one or more aspects of motivation, yet none of which promises to be a comprehensive explanation of this phenomena. Beside theories which purport to deal with motivational variables and constructs directly, almost every theory of personality and most theories of learning implicitly or explicitly deal with motivation as an important variable. To review all of the published theories would necessitate at least a book in itself. A few major reviews of theories in each of several areas follows. In the field of personality theory the most thorough and scholarly review is done by Hall and Lindzey.[1] The current writings in the field of personality are reviewed yearly in the Annual Review of Psychology[2] by Sears (1950), Mac Kinnon (1951), Eysenck (1952), Bronfenbrenner (1953), Child (1954), Nuttin (1955), Mc Clelland (1956), Eriksen (1957), Himmelweit (1958), Blake and Mouton (1959), and Atkinson (1960). Motivational matters are treated almost as frequently in the Annual Reviews under the general topic of learning. Hilgard[3] and Estes[4] present the most thorough and scholarly review of theories. The Annual Reviews have included specific chapters on motivation only twice, by Mowrer (1952) and Cofer (1959). In the 1960 edition of Annual Reviews a report of the editorial committee announces that henceforth learning and motivation are to be treated together under six aspects, two of which are to be reviewed each year. This may augur true for Cofer's statement in the

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[1]Calvin S. Hall and G. Lindzey, Theories of Personality (New York: John Wiley, 1957).

[2]Annual Review of Psychology, Annual Reviews, Inc., Palo Alto, California, 1950-1960.

[3]Ernest R. Hilgard, Theories of Learning (New York: Appleton Century Crofts, Inc., 1956).

[4]W. K. Estes et al., Modern Learning Theory (New York: Appleton Century Crofts, Inc., 1954).

1959 edition that, ". . . if present trends continue, motivation as a distinctive concept, coordinate to other psychological concepts, may well disappear."[1] In spite of the trend by Annual Reviews the Nebraska Symposium on Motivation[2] makes a significant contribution to the study of motivation by the annual presentation, since 1953, of reviews of major endeavors in this area. In 1958, Gardner Lindzey[3] edited a book which presented eight different major approaches to motivation. In the area of theory most closely related to the present study major contributions or reviews are made by Brookover,[4] Combs and Snygg,[5] Cooley,[6] Hamachek,[7] Mead,[8] Rogers,[9] Sarbin,[10] Symonds,[11] and Wylie.[12]

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[1]Charles W. Cofer, "Motivation," Annual Review of Psychology, Annual Reviews, Inc., Palo Alto, California, Vol. 10, 1959, p. 194.

[2]M. R. Jones, ed., Nebraska Symposium on Motivation (Lincoln, Nebraska: University of Nebraska Press, 1953-1960).

[3]Lindzey, Assessment of Human Motives, op. cit.

[4]Wilbur W. Brookover, "A Social Psychological Conception of Classroom Learning," School and Society, Vol. 87, 1959, 84-87.

[5]Arthur W. Combs and D. Snygg, Individual Behavior (Revised Edition, New York: Harper and Brothers, 1959).

[6]Charles H. Cooley, Human Nature and the Social Order (New York: Scribner's, 1902).

[7]Donald E. Hamacheck, Relationships Between the Self-Images of Elementary School Children and Certain Measures of Growth, Doctoral Dissertation, University of Michigan, 1960.

[8]George H. Mead, Mind, Self, and Society (Chicago: University of Chicago Press, 1934).

[9]Carl R. Rogers, Client Centered Therapy (Boston: Houghton Mifflin, 1951).

[10]Theodore R. Sarbin, "Role Theory," in G. Lindzey (ed.), Handbook of Social Psychology (Reading: Addison-Wesley, 1954), pp. 238-258.

[11]P. M. Symonds, The Ego and The Self (New York: Appleton Century Crofts, 1951).

[12]Ruth C. Wylie, The Self Concept (Lincoln: University of Nebraska Press, 1961).

In the final chapter of Lindzey's volume Allport summarizes the present state of motivational theory and knowledge in the following passage.

> Even at the coarser levels of analysis we are not in agreement on the kinds of units we seek. Shall they be habits or habit systems, needs or sentiments, vectors, factors, trends or traits? Shall they be drives or dimensions, Anschauungen or attitudes, regions, syndromes, personal constructs or ergs? All have been proposed and empirically defended. The most hopeful note in the confused situation is that for the past thirty years there has been boundless zeal for both measurement and theory. By now the measured aspects of personality cannot fall far short of the 14,000 instinctive units reported by Bernard. When psychologists face up to this orgy of units, let us hope they will not fall into the state of collapse that terminated the earlier search for instincts. There seems to be no immediate danger, for one reads in the American Psychologist (1957, p. 51); 'A Ford Foundation grant of $238,400 will enable a research team of the University of Minnesota to conduct a five year study aimed at developing a more adequate system of descriptive, diagnostic, and dynamic categories . . . The team will work toward developing terms or systems of terms maximally descriptive of personality.'[1]

As should be obvious from the above cursory review no single definitive and satisfactory theory of academic motivation emerges from present theoretical formulations. This state of affairs leaves two alternatives, either to rather arbitrarily choose a theory of motivation from among those reviewed, or to construct a theory of academic motivation to suit the present study from a number of theoretical sources. The latter alternative prevails; a theoretical framework is specifically constructed for use in this study.

Statement of the Problem

The problem of the present study is primarily concerned with the development of an eclectic theoretical framework that explains factors

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[1]Gordon W. Allport, "What Units Shall We Employ?" in Lindzey, Assessment of Human Motives, op. cit.

that motivate students at different levels of academic achievement. Secondarily, this study is concerned with a pilot test of the validity of a series of hypotheses deduced from this eclectic theory through the use of an instrument composed of objective type items selected from the instruments developed and used in the Farquhar motivation study.[1] This pilot test is made through an analysis of the responses made by four defined criterion groups of male eleventh grade students to the items on the instrument developed.

The Hypotheses

From the theory of this study a series of differences between male high school students at four different achievement and motivation levels are hypothesized. (See Chapter IV for a statistical definition of the four defined criterion groups.)

In the test of hypothesis based on responses to individual items the hypothesis stated directionally is:

> The four defined criterion groups of students will respond differently, in the predicted direction, to each item on the theory based instrument.

In the test of the hypothesis based on mean response scores of each of the defined criterion groups to clusters of items grouped around a theoretically defined characteristic of academic achievement motivation the hypothesis stated directionally is:

> There is a difference, in the predicted direction, between the mean score of each of the four defined criterion groups of students on each of the scales measuring a theoretically derived characteristic of academic achievement motivation.

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[1]William W. Farquhar, A Comprehensive Study of the Motivational Factors Underlying Achievement of Eleventh Grade High School Students, Research Project No. 846 (8458); Supported by the U. S. Office of Education, in cooperation with Michigan State University, 1959.

In the test of the hypothesis based on total response scores to all of the items constituting all of the theorized characteristics of academic achievement motivation (the total instrument) the hypothesis stated directionally is:

> There is a difference, in the predicted direction, between the total response score of each of the four defined criterion groups of students on the academic achievement motivation instrument.

Organization of the Study

The general plan of the study is to present the theory of motivation in Chapter II and to apply it to the derivation of hypotheses about differences between students at various levels of academic motivation and achievement in Chapter III. In Chapter IV instrumentation, sample selection and procedures of data analysis are presented. The analysis of the data is reported in Chapter V. The results are discussed in Chapter VI. The summary, conclusions, and implications for further study and theory development appear in Chapter VII.

CHAPTER II

AN ECLECTIC THEORY OF MOTIVATION

The theory which follows constitutes an attempt to logically build a conceptual framework from which academic achievement motivation may be analyzed. Major constructs are adapted from Barnard, Bills, Snygg and Combs, Cooley, Homans, Kelly, Lewin, and Sarbin. However, the delineation and combination of these constructs in the present context is not intended to be, and often is not, identical with their original definition and use. The following constructs are progressively interrelated and linked together into a total framework so that an eclectic theory of academic achievement motivation results from which a series of hypotheses are derived in Chapter III.

Self Image

A self image develops only through activity and interaction. As a person engages in activity he is aware of both self and non-self elements of the activity.[1] The self relevant aspects are abstracted from the total activity and form a pattern of perceptions and perceived relationships characteristic of the self in the particular activity context. This process is especially evident and important as a result of "evaluational interaction with others."[2] Over time a great number of self relevant abstractions are derived from a multitude of interactions in which one participates. When a plurality of abstractions of self relevant data are perceived by

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[1]D. Snygg and Arthur W. Combs, Individual Behavior (New York: Harper and Brothers, 1949).

[2]Carl R. Rogers, Client Centered Therapy (Boston: Houghton Mifflin Company, 1951), p. 498.

the person to be comprehensible by one self relevant pattern this pattern of related data is organized into a self image. A self image is defined as a person's perceptual organization of what he is and does in some meaningfully organized context. From all of the activities and interactions in which a person, acting as a student, engages he abstracts self relevant data which he perceives to be pertinent to himself as a student. These abstractions he organizes into his student image--a definition of himself as a student. Other images are similarly formed. A person has as many images of self as he has different areas of activity from which he can abstract data sufficient to organize a distinct and meaningful image.

Self Concept[1,2]

Once an image is formed the person further abstracts from the image self relevant data which he perceives to be consistent and or persistent over multiple images. From these persistent and consistent elements of images the self concept is organized. Self concept then is seen in the phenomenological sense as that which signifies the personal organization of concepts by which the individual in general defines himself. It refers to the definite and fairly stable characteristics of self,[3] to the individual as he is known to himself.[4]

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[1]Calvin S. Hall and G. Lindzey, Theories of Personality (New York: John Wiley, 1957), p. 468.

[2]Arthur W. Combs and D. Soper, "The Self, Its Derivative, Terms, and Research," Journal of Individual Psychology, Vol. 12, 1957, pp. 134-145.

[3]Snygg and Combs, loc. cit.

[4]Rogers, loc. cit.

Self Concept and Self Image

Self images are defined as what the person does in some meaningfully organized context. Self concept is defined as what the person is, abstracted from what self persistently and consistently does in multiple contexts. Thus the self concept is derived from self images. Not all of the movement and influence between images and concept is in the direction of image to concept. Self concept exerts an influence upon images by projecting the essential elements of what one is into the operational aspects of what one does. The projection of self concept into self image and thus to self activity is crucial to all human activity. Without it there could be no stable, persistent, and consistent perception of self identity. The self would be continually changing and reorganizing itself on the basis of the data which is abstracted almost constantly from the activities and interactions in which one engages. Such a situation would cause the self concept to change so rapidly, or to expand into such a complex organization, that a stability of self identity would be a practical impossibility. In order to avoid this dilemma man is possessed of a most basic propensity to maintain his perceptual organization of self. The self concept once developed exerts influence upon subsequent perceptions and experiences both in their selection and in their interpretation so that the self may be maintained.[1]

Motivation

So basic is the self maintenance need that for the purposes of this study it is viewed as the source of all motivation. This position is not far from Roger's statement that, "The organism has one basic tendency and striving--to actualize, maintain, and enhance the experiencing

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[1]Snygg and Combs, op. cit., pp. 83-85.

organism."[1] Similarly, Snygg and Combs state that, "The basic human need is held to be 'the preservation and enhancement of the phenomenal self.'" The phenomenal self is defined as being, "all those parts of the phenomenal field which the individual experiences as part or characteristic of himself."[2]

Motivation-Maintenance-Interaction

The basic assumption that self maintenance is the source of all motivation, leads to a need for analysis of this process. Because self concept is abstracted from self images, the most direct approach to understanding maintenance is to examine image maintenance. All self images are initially organized from patterns of abstractions drawn from activity and interaction. In order to preserve this nature of images, as activity and interaction derived, it is necessary that maintenance as well as development of images be accomplished through interaction. To maintain an image in a manner not based on interaction, such as through fantasy action or personality mechanisms, is to change the basic nature of the image from its initial state. Such action can not truly be termed maintenance due to the basic change involved. Thus, while people commonly employ various and often devious non-interactional methods of self "maintenance" these are beyond the present concern.

Reality

In the present context only reality oriented maintenance will be considered. Reality will be defined as the perception held in common by a majority of others relevant to an interaction.[3] Maintenance will only

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[1]Rogers, op. cit., p. 487.

[2]Snygg and Combs, op. cit., p. 58.

[3]Robert E. Bills, "About People and Teaching," Bulletin of the Bureau of School Service, College of Education, University of Kentucky, Vol. 28, December 1955, p. 13.

be possible through further interaction within the activity area encompassed by the image being maintained. Such interaction is maintaining if it is followed by abstraction of image relevant data which is confirming or favorably evaluating of the image as presently organized.

Interaction

Interaction, the essential ingredient of maintenance, is carried on at various levels of awareness. Some interactions are carried on at a level of awareness beneath that required for the abstraction of self relevant data. If no self relevant data is abstracted from an interaction it will not be significant for self. Conversely, what is significant may be defined as any activity, interaction, or other from which self relevant data is abstracted. Thus it is proper to speak of significant activity, significant interaction and significant others.[1-3]

Significance

Significance[4,5] is a complex concept which has both qualitative and quantitative dimensions. The qualitative dimension refers to the image to which the significance is relevant. If the image is an important one, one from which much of self concept is abstracted, then the quality of

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[1]Mead, op. cit., p. 134.

[2]Charles H. Cooley, Human Nature and the Social Order (New York: Scribner's, 1902), p. 152.

[3]Malcolm W. Helper, "Learning Theory and Self Concept," Journal of Abnormal and Social Psychology, Vol. 51, 1955, pp. 184-194.

[4]Ely Chertok, The Social Process of Self Conception, Doctoral Dissertation, University of Washington, Dissertation Abstracts, Vol. 15, 1955, p. 2330.

[5]Betty F. Mannheim, An Interpretation of the Interrelations of Reference Groups, Membership Groups and the Self Image: A Test of the Cooley-Mead Theory of the Self, Doctoral Dissertation, Dissertation Abstracts, Vol. 17, 1957, pp. 1616-1617.

significance is great. Quantity of significance refers to the amount of data abstracted and can vary in number of units or in value per unit. If the amount of data abstracted from a single interaction of a certain duration is great then value per unit is high. If the number of these periods of interaction is increased quantity of significance is thus also increased.

Awareness

It was previously stated that a certain level of awareness is necessary before significance is possible. Levels of awareness are not constant but change from interaction to interaction and even within an interaction.[1] In explaining and categorizing levels of awareness in the typical phenomenological manner the following terms and constructs are used.[2-4] This categorization differs only slightly from Organismic theory.[5] All interaction, past, present or future, at any level of awareness or anticipation, constitutes a person's field. Levels of awareness of elements within a person's field shift from time to time. Aspects of field of which one is highly aware at a given time are termed figure. Peripheral or background aspects of field of which one is relatively unaware at a given moment are termed ground.[6] In the present context the elements of field above the level of awareness necessary for significance will be called figure. Those beneath this level of awareness will be called ground. Thus figure is the crucial element of present concern.

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[1]Rogers, op. cit., p. 483.

[2]Paul F. Lazarsfeld and W. Thielens Jr. with David Riesman, The Academic Mind (Glencoe, Illinois: Free Press, 1958), p. 264.

[3]K. Koffka, Principles of Gestalt Psychology (New York: Harcourt, 1935).

[4]Snygg and Combs, op. cit., p. 15.

[5]K. Goldstein, The Organism (New York: American Book Co., 1939).

[6]Snygg and Combs, op. cit., p. 17.

Phenomenological theory holds that the process by which elements of field rise into figure or into sharper focus is a process of differentiation. As an element of field rises into figure the individual's awareness of it becomes more acute and more detailed. The differentiation process is held to be a part of the over-all procedure by which an individual satisfies his need, the basic need being the maintenance and enhancement of the self. Thus an individual differentiates into figure those aspects of his perceptual field which he perceives will help satisfy the basic need to maintain and enhance self. Need then determines figure.

Figure

Figure can change in type and in intensity. It changes in type when the elements constituting figure change. It changes in intensity when the degree of awareness or strength of focus upon an element changes. The more clearly an element is perceived to be related to self maintenance the greater becomes the portion of figure occupied by it. Also, the more immediate the maintenance need with which an element is associated the more it monopolizes figure.[1] As one element monopolizes figure other elements must fade relatively farther into ground. The above constructs of figure and field coincide logically and psychologically with the assumption made earlier that the source of all motivation was self maintenance. Phenomenologically reconstructed, this basic assumption again emerges from a different set of constructs. First, all behavior is consistent with and dependent upon the elements of a behaver's field. Second, behavior is especially dependent upon elements in figure. Thirdly, figure differentiates out of field on a satiation-deprivation continuum relative to self maintenance need. Thus behavior is again seen to be ultimately dependent upon self maintenance.[2]

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[1]Snygg and Combs, op. cit., p. 51.

[2]Ibid.

In summary of this tripartite relationship it is seen first that behavior depends upon what is in figure at the moment of behaving. Second, what is in figure depends upon self maintenance need perceived at the moment. Thus as maintenance need relative to an image is perceived (deprivation) that image will differentiate into figure. As it becomes figure it will become determinant of behavior which is always consistent with the phenomenal field at the time of behaving. As the perceived need is satisfied (satiation) the image will fade more into ground, another image relative to a perceived maintenance need will rise into figure, and behavior will change. Such a satiation deprivation continuum is similar to Maslow's continuum upon which his hierarchy of needs operates.[1]

Dimensions of Self

Underlying all of the preceding constructs is the assumption that all behavior is motivated by self maintenance. It is, from a different point of view, possible to conceive of a situation in which there is no maintenance need, where self is presently satiated and maintenance deprivation does not exist. In order to explain this apparent dilemma which would lead to inertia it is necessary to discuss the dimensions of self. Constructs are developed around three dimensions of self. Typically self theorists have contented themselves with two dimensions, the real self and the ideal self.[2-4] However, with the emphasis of the present research being on dimensions of self as they relate to motivation, an intervening construct between real self and ideal self termed the disposed self is postulated.

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[1]A. H. Maslow, Motivation and Personality (New York: Harper, 1954).

[2]Karen Horney, quoted in T. M. Newcomb, Social Psychology (New York: Dryden Press, 1950), p. 386.

[3]Rogers, op. cit.

[4]W. Stephenson, The Study of Behavior (Chicago: University of Chicago Press, 1953).

This construct of disposed self is somewhat akin to the analysis of "selves" suggested by Cattell,[1] and yet goes farther in specification of a separate construct between real and ideal.[2]

Real self is defined as the present perceptual organization of self in terms of current concept and images. Ideal self is a perceptual organization of self concept and images as self would "wish" to be if self and non self could be organized to the greatest perceived advantage of self. Disposed self is a construct between real and ideal self. It is the perceptual organization of self emanating from a "desire" or need disposition to perceive of self differently than real self in the context of a future "reality" oriented perceptual organization. Disposed self may be thought of not as what one is (real self) or what one wishes he could be (ideal self) but rather as what one strives for and expects to be in a "reality" sense.

Maintenance and Enhancement

Viewing motivation and its source in self maintenance relative to the preceding three dimensions, self deprivation relative to real self is properly termed self maintenance need while deprivation relative to disposed self is more precisely termed enhancement need. Ideal self as a distinct construct is not of itself capable of producing perceived deprivation directly. It can indirectly effect deprivation and motivation when aspects of ideal self are deduced into the perceptual organization of disposed self such that these deduced ideals become part of disposed self and thus a source of enhancement need. Even though ideal self is not directly a motivating factor it can give directional indications of potential aspects of disposed self which might be the basis for future enhancement need.

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[1]R. B. Cattell, Description and Measurement of Personality (New York: World Book Co., 1946).

[2]Cattell, Personality: A Systematic, Theoretical and Factual Study (New York: McGraw, 1950).

Motivation in the present context is still seen to have its source in self maintenance, however, because such need can be deprivation perceived relative to maintenance of a real self image or to maintenance of a disposed self image a distinction in terminology is made. If deprivation is perceived relative to real self image it is maintenance motivation, if relative to disposed self image it is enhancement motivation. In spite of this distinction real self is the base upon which all motivation is measured. Maintenance motivation is measured from real self down to presently perceived need level for maintenance. Strength and type of motivation is determined by the amount and type of deprivation perceived such that the degree of deprivation perceived relative to real self and the degree of perceived discrepancy between the real and disposed self are an indication of the strength or amount of motivation.

The above constructs and dimensions of self are not precisely orthodox according to either organismic, self, or phenomenological theory. For a consideration of the more orthodox constructs the reader is referred to discussions of the ideal self, self actualization and self realization in Adler,[1] Angyal,[2] Bills,[3] Cattell,[4] Rogers,[5] and Snygg and Combs.[6]

Non Self

While the strength and direction of motivation has its source in self, the part played by non self, within the field as perceived by self, can not

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[1]A. Adler, The Practice and Theory of Individual Psychology (New York: Harcourt, 1927).

[2]A. Angyal, Foundations for a Science of Personality (New York Commonwealth Fund, 1941).

[3]Bills, op. cit.

[4]Cattell, Personality: A Systematic, Theoretical and Factual Study, op. cit.

[5]Rogers, op. cit.

[6]Snygg and Combs, op. cit.

be ignored. In a reality orientation self must interact with non self aspects of field as these are perceived. Non self aspects of field are differentiated and focused into figure on the same deprivation-satiation continuum as are self aspects of field. Thus any aspect of non self perceived to be maintaining or enhancing of the self image in figure is also in figure. Enhancement motivation is measured from real self foreward to enhancement deprivation level. It is the discrepancy between real self image and disposed self image. To enter into a discussion of all of the possibly relevant aspects of non self is beyond the scope of this study. However, the aspect of non self that is loosely termed society is of such great importance for the formation, maintenance and enhancement of self images that a few of the most crucial societal constructs will be examined.

Society

Within society there exist a set of constructs closely parallel to the previously discussed image-concept constructs of self. Theory and research presenting and analyzing these societal constructs often use simply the terms role, position or status. Neiman and Hughes[1] who reviewed over eighty sources reported finding "vague, nebulous and nondefinitive" use of the above terms. Because of lack of clarity and non-univocal usage, and because at this point in the development of the present theoretical framework problems associated with Murphy's[2] third level of complexity are encountered, a rather simplified presentation of the societal constructs is presented. The more demanding reader is referred to Newcomb,[3]

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[1]L. J. Neiman and J. W. Hughes, "The Problem of the Concept of Role--a Resurvey of the Literature," Social Forces, Vol. 30, 1951, pp. 141-149.

[2]Gardner Murphy, in Personality, quoted by T. M. Newcomb, Social Psychology (New York: Dryden Press, 1950), p. 312.

[3]Newcomb, op. cit.

Sarbin,[1,2] and Parsons and Shils,[3] for more complete and precise treatments of societal constructs. The constructs presented here are adapted largely from those developed by Brookover.[4]

The basic constructs relative to self organization are image and concept, relative to social organization they are role and position. The two sets of constructs have many parallel features. In societal interaction is it observed that persons come to pattern their behavior exchanges. From a series of societal interactions there then may be abstracted data perceived to be comprehensible by a single organizational definition. Such a societally organized definition of activity pertinent to a particular interaction pattern is called a role.[5] The various aspects or facets of such a definition are termed role expectations. Society further abstracts from a multitude of roles, which are perceived to be comprehensible by a single more general meaningful pattern of interaction, the consistent and persistent elements of these roles and organizes them into a definition of what this role is in general.[6] Such a definition generalized across multiple instances of the same role is called a position. Thus in the present context, role is the societal definition of what is expected of one in a particular interaction situation. Position is the societal definition of what is expected of one in a general interaction situation.

A further parallel is observed between self and society. Just as self is motivated by the need to maintain self images and concepts so society is motivated to maintain roles and positions. Societal maintenance and enhancement is accomplished through the creation of prescriptions.

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[1]T. R. Sarbin, "The Concept of Role Taking," Sociometry, Vol. 6, 1943, pp. 273-285.

[2]Sarbin, "Role Theory," op. cit., pp. 223-259.

[3]T. Parsons and E. A. Shils, Toward a Theory of Action (Cambridge: Harvard University Press, 1951).

[4]W. B. Brookover, "Research on Teacher and Administrator Roles," Journal of Educational Sociology, Vol. 29, Sept. 1955, pp. 2-13.

[5]Ibid., p. 4. Brookover uses the term expectations of status in situation.

[6]Ibid., pp. 3, 4.

Prescriptions are defined aspects of roles or positions to which are attached sanctions, generally classed as rewards and punishments. Such prescribed aspects of roles can vary from prescribed incumbence in role to prescribed details of behavior within the role. Usually the sanctions, at the disposal of the society defining the role and attaching the prescriptions, will be meted out in some direct relation to the degree to which the role incumbent fulfills the role expectations. Negative sanctions or punishments are most often related to maintenance of role while positive sanctions or rewards are most often related to enhancement within a role.

The members or group within society who weigh performance in a role or position are called the audience of evaluation. Relative to certain roles or to certain aspects of role performance society may prescribe the audience of evaluation.

Within society there exist a multitude of roles and positions. Not all roles are available to all people, for no person can meet the prescribed expectations necessary for incumbence in all roles. However, those roles whose prescribed expectations society perceives as fulfillable by a person are, from the societal point of view, available to the person. Such available roles and positions or available rewards attached to roles are termed societal opportunities.

Self and Society

Not all societal opportunities are perceived by the self as opportunities. The general law of perception based on a self maintenance or enhancement deprivation continuum applies to perception of opportunity. "Opportunity can not be offered successfully in the absence of need"[1] for in the absence of need it will not be perceived by self. If the opportunity

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[1]Bills, op. cit., p. 13.

associated with role or role rewards and punishments are not perceived as relevant to self maintenance or enhancement they have no effect on the behavior of self. For this reason society, in order to maintain its present organization of roles and positions, imposes prescriptions upon the aspects of role behavior it deems necessary to maintenance. In this context, the imposition of prescriptions is seen as an attempt by society to define for the self certain aspects of role behavior which will be significant for self. Frequently a prescribed aspect of role is the prescription of the audience of evaluation. In this case the prescription of audience of evaluation is an attempt by society to define for self who significant others are relative to the role incumbence of self. The effectiveness of such prescriptions, as described above, depends on self image.

Once an image is organized from data abstracted from interactions within a role it can only be maintained through further interaction within the role. The behavior and or the audience of evaluation may be prescribed pertinent to an interaction which is necessary for maintenance of a self image. If such is the case then the role expectations prescribed must be met by the self within the interaction in order to receive the confirmation or evaluation necessary for maintenance or enhancement of the role derived image. Usually self can maintain a role derived image at the marginal level by merely fulfilling the expectations prescribed for incumbence in the role. Looked at from another point of view, this implies that the marginal measure of maintenance prescribed by society for incumbence in a role is the measure of the minimal amount of significance which self must attribute to the prescribed expectations or audience of evaluation of that role. Thus the aspects of role, prescribed or ascribed, will be significant only in so far as they are perceived by self as necessary to image maintenance or enhancement. Beyond this self defined level there is no significance and thus prescriptions fade from figure to ground and become non operant. Once again the constructs ultimately reduce themselves to dimensions of the self for their measure and meaning.

The above brief discussion of self and society suffices for the present study. It presents the few basic positions necessary for the derivation of hypotheses and interpretation of results presented in this study. With these constructs in mind a presentation is to be made of a self economy context in which it is here assumed that the self operates. The majority of the constructs developed within the present exposition of a self economy owe their original exposition to behavioral psychology.[1,2] In their present form they are derived most directly from Homans[3] who credits both behavioral psychology and elementary economic theory for the constructs which he uses in a sociological context.

Self Economy

The basic assumption made about the self is that all activity is motivated by the need to maintain or enhance self. What is perceived as either maintaining or enhancing is termed reward. It thus can be said that all self behavior is motivated by reward.

Within the sphere of self there is an economy imposed by the fact that time, energy, effort, in fact all factors, necessary for attaining reward are possessed in limited quantity. Furthermore, the same unit of time, energy or any other self factor, once expended, can not be re-expended nor can the same unit be expended in more than one activity simultaneously. Such limitations on self are held to impose the profit principle on self behavior. That is, in an economic sense, any activity by self will be motivated in terms of maximizing profit as profit is presently defined.

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[1]B. F. Skinner, The Behavior of Organisms (New York: Macmillan Co., 1938.

[2]Skinner, Science and Human Behavior, ibid., 1953.

[3]George C. Homans, Social Behavior, Its Elementary Forms (New York: Harcourt Brace and World, 1961).

Profit

Profit is defined economically as reward minus cost. Because in a self context reward is defined as what is perceived to be self maintaining or enhancing it follows that profit must be weighed in maintenance and enhancement terms also.

Cost

Cost as seen in this self context, is a subtraction from reward. It is thus defined relative to reward. Cost is reward not gained, in other words, reward foregone.

Alternatives

The application of the profit concept to self behavior necessitates a shift in the emphasis of motivation from the classical energy concept to a view similar to Kelley's[1,2] in which motivation is seen as the determiner of the choice among alternative courses of activity perceived as available by the self. In such a context, behavior is viewed as a choice made among alternative courses of action open to the self at the time of action. The factors upon which this choice of alternatives is made, here self maintenance or enhancement, is "motivation."

The Profit Formula

In the above context the profit formula is seen as equivalent to a motivation formula, for it is on this formula that the choice among

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[1]G. A. Kelly, The Psychology of Personal Constructs (2 volumes; New York: Norton Press, 1955).

[2]Kelly, "Man's Construction of His Alternatives," in G. Lindzey, Assessment of Human Motives (New York: Grove Press, 1958).

alternative courses of behavior is based. In more detail the profit formula states that profit is equal to reward minus cost. Reward is defined as what self perceives as maintaining or enhancing. Cost now can be defined as rewards which might have been gained from the choice of competing alternative actions which self foregoes in order to behave in the way chosen.[1]

Relative to every action there always exists at least one alternative, be it only the marginal alternative of not acting. More frequently there exist a variety of alternative forms of activity in which the self might engage at any one time. The greater the reward perceived by self accruing to these alternatives the higher the cost if they are foregone. It is important, and should be emphasized, that for the reward of an alternative course of action to be considered as cost, the alternative must be a competing alternative. That is, the alternative must be perceived as rewarding and the attainment of this reward and the reward attached to the alternative chosen must be at the same time mutually exclusive. By mutally exclusive is meant that the two rewards are not attainable at the same time and that to choose one is to either forego or delay (temporarily forego) the other. If an alternative is delayed the cost is not as great as if it is ultimately foregone.

Costs

The above formulation of cost, as reward foregone, is the general one applied here. However, such a formulation necessitates an explanation of traditional conceptualizations of cost. Cost is commonly viewed in terms of units of output such as time, effort, and energy. In the present formulation these do not directly define cost but rather serve in a more indirect way as measurements or indications of cost. Such output constructs explain what must be expended to attain a reward and are not

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[1]Homans, op. cit., p. 59.

seen here as costs in and of themselves. Rather they are seen as cost elements only in so far as their extent or direction is a measure of the extent or duration of what is foregone. For example, to spend a number of hours on a rewarding project may be costly as well as rewarding. Its cost is not the hours spent. The cost is the other competing alternative rewards which might be attained in the time which is spent in undertaking and completing the project. The longer the time the greater the other rewards foregone. Thus output constructs, while they do not constitute cost, indicate a measure of cost.

Punishing activities are often viewed as cost.[1] Here the reformulation is a bit more subtle. To escape punishment is rewarding. In order to escape punishment attached to an activity, this activity must be stopped and some alternative activity chosen. By nature of the fact that the escape from punishment is rewarding, it is seen that this reward of escape accrues to the alternative chosen when the punishing activity is foregone. In this sense punishment is not seen directly as cost of an activity but rather as an element which adds to the reward of its alternative. Such a formulation may appear to be an artifact in the face of the rather blatant reality that punishment hurts. It may seem unreal to conceive of it relative to reward rather than cost. Yet in the present context it must be viewed relative to reward in order to keep the profit formula strictly based upon reward, reward attained minus reward foregone. Thus punishment is seen in terms of the reward attained by choosing an alternative to it. Conversely, to choose an alternative to which punishment aspects attach themselves is to undergo a dual cost. This dual cost is composed of the reward accruing to the foregone alternatives and the reward accruing to the escape from punishment.

The last complicating aspect of cost emerges when there exists image conflict relative to an alternative such that the return from an activity is rewarding to one image and devaluing of another image.

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[1] Ibid., p. 25.

The fact that one image is devalued must be considered as the opposite of reward, therefore as cost. Here again, to avoid or escape devaluation is rewarding. To forego this avoidance of devaluation is to forego reward, and as such must be added to the reward of alternatives foregone, cost.

The above situation is closely related to the circumstance which arises when both maintenance deprivation relative to one image and enhancement deprivation relative to another image are perceived simultaneously. If the positive rewards seen to accrue to the alternatives associated with both images are equal the maintenance alternative will be chosen. This is true due to the fact that in choosing the maintenance alternative the reward of avoiding non maintenance or devaluation of a real image is also attained. If the competing enhancing alternative were chosen, rather than attaining this added reward, the added reward of escape from devaluation would be foregone. Because the foregoing of a maintenance reward entails giving up a need relative to real self, here and now deprived, it is a final foregoing. Maintenance need is need in the present and if foregone now the present passes on and the need satisfaction is not attained but is foregone. An enhancement reward is not in the same way foregone because enhancement need is need relative to a future reality oriented self organization and can be delayed rather than only foregone. The reward foregone is less if it is an enhancement reward.

Maintenance Threat

One additional cost factor enters the situation when the maintenance need is relative to fulfillment of a prescribed expectation. In such an instance, to forego maintenance is also to incur the negative sanctions attached to the prescription. This is either devaluing or punishing in the same sense as was explained above.

To forego a prescribed maintenance alternative is not only to forego its reward but is also to undergo punishment or devaluation which adds the element of threat.[1] Threat is present whenever one perceives potential devaluation of a self image. If the image is not maintained it is devalued. Thus, near the marginal maintenance level where expectations are prescribed, if expectations are not met self image is devalued. It is for this reason that role perceptions from the societal view, or real self images from the self view, which are maintained by interactions near the prescribed marginal maintenance level are apt to contain elements of threat. When a maintenance or real self need is perceived the relavant image that rises to figure is accompanied by the perception of threat. Threat tends to focus the image threatened more intensely into figure so that other perceptions will be relatively farther in ground. This strong focus on a threatened image narrows total perception so that self will become relatively less aware of non self aspects of field. Under these conditions the alternatives perceived will be reduced which in turn will cause self to perceive less cost in foregoing them. This low cost of alternatives and high reward associated with the maintenance activity will greatly increase the probability of choosing the maintenance alternative and foregoing all other competing alternatives.

Enhancement Profit

When no real self need or maintenance deprivation is perceived the competing alternatives are enhancement alternatives and are measured on a simple reward of alternative undertaken minus reward of alternative foregone basis. Enhancement deprivation is perceived when there is a discrepancy between a real self and a disposed self image. The amount of deprivation perceived depends upon the degree of discrepancy and the importance of the image relative to which the

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[1]Bills, op. cit., p. 10.

discrepancy is perceived. Importance of a disposed self image depends upon the importance of the image for a future perceptual organization of self concept. Thus if self perceives the disposed image as being the source of a large amount of data from which concept of self at some future time is to be abstracted then the enhancement deprivation and motivation is great and the probability of action in this direction or choice of an alternative enhancing of this image is great.

Summary

The main constructs relative to self and non self which are used to explain the motivation of students in the next chapter have been presented in this chapter. The constructs are based on a self image, self concept view of human behavior. Maintenance and enhancement of self is the source of all motivation. Maintenance and enhancement are accomplished in a reality orientation only through significant interaction. A certain level of awareness is necessary for significance. This awareness is determined by a satiation-deprivation continuum upon which self images and perceptions rise to figure and fade to ground within the self's field. The satiation-deprivation continuum is closely related to and dependent upon the dimensions of self. Maintenance deprivation is perceived relative to real self while enhancement deprivation is perceived relative to disposed self. Disposed self is the perceptual organization of what one strives for and expects to be in a future "reality" oriented context. Ideal self is non motivational but is the source of deduced aspects of disposed self and as such can indicate direction of future motivation.

Non self was briefly discussed with the emphasis on societal constructs. Position and role as societal constructs are viewed as parallel to the self constructs of concept and image. Societal maintenance is accomplished through prescriptions which determine expectations and

sanctions. Prescriptions are related to and partly determinant of opportunity and audience of evaluation.

The self operates in an economy in which actions or choice of alternatives are based on a profit formula. Profit is reward minus cost. Reward is self maintenance of enhancement attained while cost is self maintenance or enhancement foregone. Punishment, devaluation of self image, and threat are factors which compound the profit formula. Finally, a consideration of reward and the cost of maintenance and enhancement alternatives is seen as necessary to a proper application of the profit formula to determination of behavior alternatives.

These constructs linked into the above framework are the basis from which a series of hypotheses are derived in the next chapter. Other operational statements could be derived from the above framework of constructs. The hypotheses deduced in Chapter III are thus not exhaustive but are a series of hypotheses particularly applicable to male academic achievement motivation in a high school context.

CHAPTER III

ACADEMIC MOTIVATION--HYPOTHESES

In this chapter the constructs presented in chapter two are employed to explain the motivational factors underlying differential levels of academic achievement. At the outset some measure of academic achievement must be adopted.

Criterion--Grade Point Average

For present purposes grade point average is adopted as the criterion measure of academic achievement. Underlying the adoption of this criterion--if the criterion is to be valid--are two implicit assumptions. 1) It must be assumed that grade point average is given in some direct relation to academic achievement such that for some unit of achievement produced a unit of grade point average is given. 2) It must also be assumed that grade point average is given only for academic achievement. Whatever the case may be in practice, these two assumptions are necessary so that it can be assumed that a relationship exists between academic achievement and grade point average such that the correlation between the two is at least high and positive. In practice the correlation is undoubtedly not +1.0 but it is probably higher than the correlation of any other criterion with academic achievement with the exception of achievement tests themselves. To avoid an achievement tautology, and because grade point average is so widely accepted and used, it is here adopted as a criterion with full awareness of its weaknesses in both validity and reliability.

When the grade point averages of a large population of high school students are examined they are found to be dispersed over a rather wide

range. Using grade point average as a measure of academic achievement, it is concluded that there exists among high school students a comparable range of academic achievement. Some students are achieving much and others are achieving less. The focal point of attention in this study is upon the explanation of this observed difference in achievement.

Aptitude

In searching for an explanation of this range in achievement one must attempt to uncover factors which explain major portions of the variance. The factor most commonly employed for this purpose is aptitude, as measured by scholastic aptitude tests. When a student's aptitude level is compared with his achievement level there is usually found a rather high positive correlation. However, the correlation is quite a bit lower than +1.0 so that the level of achievement is not perfectly predicted or accounted for by aptitude level. Reports of research on academic achievement usually show that aptitude correlates higher with achievement than any other single criterion upon which prediction can be made. Thus it is commonly found that aptitude, as measured by scholastic aptitude tests of one kind or another, is adopted as a criterion for establishing predicted or expected level of achievement in studies using a regression technique. Because aptitude is not a perfect predictor, and as such cannot totally account for achievement level, a question as to its legitimacy as a criterion might be raised.

Aptitude and Achievement

Here the reason for using aptitude as a predictor of expected level of achievement rests only partly on the high positive correlation with grade point average. More important is a basic assumption derived from the definition of aptitude itself. Arising from the concept of academic aptitude is the implicit assumption that given students with the same

academic aptitude the same academic achievement level should be attained, if all else is equal. Because it is observed that this relationship between academic aptitude and academic achievement does not hold true in practice there are two alternatives to confront. The assumed relationship can be rejected on the basis that such an aptitude-achievement relationship simply does not exist. On the other hand, the assumption of this relationship can be retained on the grounds that it holds true--if all else is equal. The fact that this relationship is not observably verified is then attributed to the fact that other relevant factors are not equal, rather than due to the fact that the aptitude-achievement relationship does not exist. The latter alternative is chosen here. It is assumed that there does exist a relationship between academic aptitude and academic achievement such that students with the same academic aptitude are expected to attain the same academic achievement level. If they do not, as is observed, this will be explainable on the basis of other relevant factors which are unequal. These factors, whatever they may be are termed academic motivation.

Aptitude and Grade Point Average

Examining the above relationships more thoroughly it is recalled that academic achievement and grade point average, in the present context, are operationally interchangeable concepts, because grade point average is the criterion of academic achievement. By making this substitution in the aptitude-achievement relationship it can be assumed that if academic aptitude is the same, grade point average should be the same, again, if all else is equal. When among students with the same academic aptitude it is observed that grade point average varies, this variance should be explainable on the basis of other unequal factors.

Academic Output--Motivation

Going one step farther, units of grade point average are given for units of academic achievement. If grade point average varies then units of academic achievement must likewise vary. Considering students with the same academic aptitude, those who achieve higher grade point averages must expend greater units of academic output than those students with lower grade point averages.

The above difference in output units between high and low grade point students can be attributed to either a qualitative or a quantitative difference, that is, it can be due to quality per unit or to number of units of academic output expended. Because all students under consideration have the same academic aptitude, it follows that the difference must not be due to quality per unit of that aptitude but rather to number of units expended. Thus when grade point is predicted by aptitude, and the observed grade point level is found to vary from its expected level, the variance can be attributed to the variance in number of units of academic output expended. It is now seen that the difference between academic over and under achievers (over and under the expected level of grade point average set by aptitude) can be studied relative to this difference in units of academic output. Academic achievement motivation in this context is then defined as the factor or factors determining the output of units of academic achievement.

Student Role

In order to explain or to uncover the motivational factors underlying academic achievement output it is necessary to examine the subjects in whom the motivational factors reside. Subjects in the present analysis are high school students. As such they are prescribed incumbents in the student role, subject to all prescriptions and sanctions relevant to that role as it is defined for them. Not all prescriptions relevant to the

position of student can be generalized to all student roles. What is more pertinent, not all of them are equally relevant in terms of the present analysis. One very important and generalizable prescribed aspect of the student role is the prescribed evaluation of the student's achievement output in terms of grade point average. This prescribed evaluation of students is made by teachers who are a prescribed audience of evaluation.

Student Image

It is assumed that every student who interacts in the student role through the grades to high school abstracts from this interaction a student image. Maintenance or enhancement of this student image is accomplished through further interaction in the student role. The success of the maintenance or enhancement is directly related to the success the student has in fulfilling the expectations of his student role. The major expectation which is relevant here is the expectation of the exchange between student and teacher of units of academic output for units of grade point average. This expectation is common to, and prescribed for, all roles subsumed under the present definition of the position high school student. It can thus be considered as a constant rather than a variable in so far as it must, by prescription, be operant at least to the marginal level in the role played by every student under consideration.

In the following sections of this chapter the theoretical constructs outlined in chapter two and the relationships and role factors just described are used as a conceptual framework from which differences among students achieving at different levels and motivated to different degrees are hypothesized. First, the generalized student is described in summary form according to the preceding constructs. Secondly, particular differentiated criterion groups of students are described on the basis of these same constructs. Thirdly, in the next chapter, an attempt is made to verify the hypothesized differences among criterion groups on the basis of objective questions.

Importance of Student Image

Each student has a self concept which is abstracted from various images, one of which is the student image. The student image can be of greater or lesser importance to a student depending on the amount of his self concept that is abstracted from and dependent upon it. If the student image is of great importance it demands much confirmation and evaluation if it is to be maintained or enhanced. This necessitates the output of a large number of units of academic achievement in order to receive the number of units of evaluation and confirmation required. High grade point students expend greater units of academic output than low grade point students with the same aptitude. Therefore high grade point students must abstract a greater amount of their self concepts from the student image than lower grade point students with the same aptitude. It follows that, the self concepts of high grade point students are maintained and enhanced to a greater degree by their student image than by other images of self. It can be hypothesized that:

H. 3.1 High grade point students should perceive of themselves more frequently in terms of values and descriptions related to and rewarding of student image than should low grade point students of the same aptitude.

Conversely, it can be hypothesized that:

H. 3.2 Low grade point students should perceive of themselves in terms of values and descriptions related to and rewarding of images other than the student image more frequently than high grade point students with the same aptitude.

Maintenance and Enhancement

The student image is abstracted from a variety of interactions encompassed by the student role in which the high school student is usually a prescribed incumbent. This image can only be maintained or enhanced by further interaction in that role. The role interaction most directly

related to present consideration is the prescribed interaction of exchange of units of academic achievement output by the student for units of grade point average from the teacher, who is a prescribed audience of evaluation. It is usually prescribed that the exchange be at a specified minimal level if the student is to be allowed to continue in the student role. This achievement level is called the prescribed or minimum maintenance level. The exchange, when carried on near this marginal level, is characterized by maintenance need and activity. As the level of exchange rises above this level it becomes characterized by less maintenance and more enhancement aspects.

Reward and Cost

Maintenance and enhancement of the student image through interaction in the student role is based upon the fulfillment of the expectations of the student role. Reward is confirmation and favorable evaluation upon which the student image is maintained or enhanced. Reward emanates from teachers, significant others, grade point average and other related values seen to accrue to the fulfillment of expectations of the student role. Cost is measured in the same dimensions relative to competing alternative activities or interactions upon which self images other than the student image are maintained or enhanced.

Profit Formula

Every activity undertaken by a student is the activity perceived by him to be the most profitable alternative available to him at the moment. It is observed that students expend varying numbers of units of activity in the exchange of academic output for grade point average. Those students who expend greater units of academic output and who thus receive higher grade point averages must perceive such output as profitable. To perceive it as profitable they must perceive either greater reward or less

cost in this exchange than those who are less involved in this exchange. It is on the basis of these perceptions of the profit formula as applied to academic achievement alternatives that the differences among the criterion groups of students are explained.

Reward Level

It is observed that some people seem to operate in general at a low level of ambition and achievement according to the commonly accepted or socially defined norms in whatever area of endeavor they are engaged. Others generally operate at a high level. In terms of the profit formula upon which behavior choice is based people differ in their activity because they perceive as profitable two different general courses of activity.

Perception, like all other behavior, is motivated by self maintenance and enhancement. Reward is defined as what is self maintaining or enhancing. It follows then that what a person perceives as rewarding is a direct function of the maintenance or enhancement of his self concept or self image.

If a person generally, in all areas of life in which he is engaged, perceives reward at a certain level, this level is a reflection of the level of his self concept. Because reward is the main element in the profit formula upon which all behavior choice is based it can be hypothesized that:

H. 3.3 The person who has a self concept that is maintainable or enhanceable at a specified level perceives reward and operates at this level of activity.

Perception of Reward and Cost

Reward is seen to be the determining element in the profit formula upon which all behavior choice is based. Thus persons with different general levels of activity must have different general perceptions of reward. It is here assumed that one major difference in perception

between the generally high level operant and the generally low level operant is that the high level operant more often perceives, and thus weighs, competing alternatives in terms of their rewards rather than their costs. He especially perceives them in terms of enhancement reward. The low level operant more often perceives and weighs alternatives in terms of cost. Thus the high level operant attempts to maximize profit by increasing reward while the low level operant attempts to maximize profit by decreasing cost. It can be hypothesized that:

H. 3.4 The person who, in general, perceives of alternatives in terms of reward is operating at a higher level than the person who in general perceives of alternatives in terms of cost.

Perception of Cost

It is assumed that low level operants attempt to increase profit by decreasing cost. If cost of an activity is cut to a low level then reward accruing to it does not have to be great for the activity to be perceived as profitable and thus undertaken. It can then be hypothesized that:

H. 3.5 The person who perceives as profitable and thus engages in activity generally perceived as not greatly rewarding is more apt to be a low level than a high level operant.

Perception of Reward

Conversely, the high level operant is assumed to attempt to increase profit by increasing reward rather than by minimizing cost. The high level operant perceives of the profit formula as high reward attained minus high reward foregone. The activity available to a high level operant must be highly rewarding to be perceived as profitable and thus undertaken. It can be hypothesized that:

H. 3.6 The person who perceives as rewarding and thus engages in activity generally perceived to be at a high reward level is more apt to be a high level operant.

Student Image--Reward and Cost

To this point the emphasis is on a general perceptual level which should be indicative of and parallel to the level of self concept. More pertinent to the present study is an emphasis on student image from which emanate specific perceptions relevant to the student role and academic achievement. Self images and self concept have a similar relationship to and influence on perceptions and behavior. Both are maintained and enhanced simultaneously through the same interactions and data abstracted from these interactions. Because of these similarities the same line of reasoning followed above relative to self concept can be applied to self images so that the four hypotheses above can be restated relative to student image.

H. 3.7 The student who has a student image that is maintained and enhanced at a specified level operates at a similar level of activity within the student role.

H. 3.8 The student who perceives of alternatives relevant to the student role in terms of reward is apt to operate at a higher level than the student who perceives of alternatives in terms of cost.

H. 3.9 The student who perceives as profitable and engages in activity within the student role which is not generally perceived as rewarding is a low level student.

H. 3.10 The student who perceives as profitable and engages in activity within the student role which is generally perceived as rewarding is a high level student.

Academic Punishment

A further factor of importance is the perception by students of the reward and cost elements relative to the achievement output for grade point exchange. Some students perceive aspects of academic achievement output such as homework, reading, studying and related activities as punishing. If so perceived, it is rewarding to avoid the punishment

by not undertaking these activities. The foregoing of academic endeavors is perceived not as reward foregone but rather as punishment avoided. This perception makes the foregoing of such activities actually rewarding rather than costly. Reward then accrues to the competing alternatives to academic endeavors. This factor tends to throw the profit formula relative to academic alternatives out of balance in favor of the competing non academic alternative. Thus the academic alternatives are apt to be less frequently perceived as profitable and undertaken. If they are not undertaken the rewards accruing to them are not attained and thus will be at a lower level. It can be hypothesized that:

H. 3.11 The low level student will perceive endeavors related to academic achievement output to be punishing.

Maintenance Threat

Relative to the student role there is usually prescribed a minimum grade point average that is necessary for continued incumbence as a student. If incumbence in the student role is discontinued the interaction upon which student image is maintained is impossible. Thus students near the prescribed minimum grade point average perceive maintenance deprivation relative to the real student image and present role incumbence. Failure to satisfy this deprivation by attaining the required grade point average is perceived as a threat to maintenance of self image as a student. The presence of the element of threat to the student image is likely to generalize to the perceptions of all significant aspects of student role upon which student image is maintained. Thus students near the prescribed minimum grade point average perceive threat attached to teachers, tests, grades and other aspects of the exchange of achievement for grade point average. It can be hypothesized that:

H. 3.12 Students near the prescribed minimum grade point average perceive threat relative to various aspects of the student role.

Maintenance Level Reward

Because of the reward attached to the escape from threat to self, students near the prescribed maintenance level of grade point average may perceive the attainment of grades slightly above this level as rewarding. It can be hypothesized that:

H. 3.13 Students near the prescribed maintenance level of grade point average perceive grades above but close to this level as rewarding.

Enhancement Level Reward

Students who are above the prescribed maintenance level of grade point average are less aware of maintenance deprivation relative to incumbence in the student role. As students get further above this level the perception of threat to student image due to the prescriptions and sanctions attached to non maintenance at the marginal level become less. As the grade point level of a student rises farther above this level his perceptions of grades, tests, teachers and other aspects of the achievement for grade point exchange are apt to be more in the realm of enhancement. It can be hypothesized that:

H. 3.14 Students who are farther above the prescribed maintenance level of grade point average perceive aspects of the student role, especially those directly related to the achievement for grade point exchange as enhancement.

Time Orientation

Maintenance need is deprivation relative to real self image and thus on a time continuum is in the present. Enhancement need is deprivation relative to disposed self image and thus is in the future on a time continuum. Students near the prescribed maintenance level perceive their needs as students as present needs and their disposed

student images are organized in terms of short term or present needs and goals. Students, as they get farther above the maintenance level, perceive of their needs relative to student image as future needs and their disposed student images are organized as long term or future needs and goals. It can be hypothesized that:

H. 3.15 Students farther above the maintenance level perceive of the rewards accruing to their student image from education and general interaction within the student role as oriented to the future and as involving long term rewards.

Unique Achievement

Students who in general consistently achieve below the prescribed maintenance level are denied further incumbence in the student role. Conversely, those students who are at any time incumbent in the student role are usually achieving at or above the prescribed maintenance level which is the lowest expected student achievement level. Students achieving near this level are achieving at a level which is common and to which low reward accrues. If the demand for academic achievers is held constant at any specified amount it follows that those students in shorter supply command a higher price, in this case reward, than those students who are in greater supply. Those students achieving at the highest grade point levels are the rarest and also achieve the most. Thus, they are able to command rewards commensurate with their high and rare level of achievement. It can be hypothesized that:

H. 3.16 Students achieving at the highest grade point levels perceive rewards accruing to their student image from education and from general interaction within the student role as rare and highly valuable rewards.

Role Expectations

Those students achieving at a high level, and thus receiving high grade point average and other rewards relevant to the student role, must expend units of academic output commensurate with these rewards. Because role behavior is evaluated and rewarded on the basis of fulfillment of role expectations those students who receive higher rewards should also be fulfilling greater role expectations. Either they should be fulfilling some role expectations to a higher degree, or fulfilling more role expectations, or both. In order to fulfill role expectations the activity specified by the expectation must be undertaken by the role incumbent. Only activities which are perceived as profitable are undertaken. To be perceived as profitable an activity must be viewed as rewarding in terms of maintenance or enhancement of self image. Thus it can be hypothesized that:

H. 3.17 Students achieving at a high level abstract and organize into their student images greater role expectations than students achieving at a lower level.

Academic and Competing Activities

When students decide whether to choose an academic or a competing alternative the rewards perceived to accrue to the alternatives are weighed in the profit formula. The alternative perceived to be the most profitable is chosen. Among students with the same academic aptitude those who receive the higher grade point averages expend more units of academic activity than those students with lower grade point averages. This expenditure must then be perceived as profitable. To be perceived as profitable the rewards accruing to it must be perceived as greater than the rewards of competing alternatives. Thus either great reward must be perceived to accrue to the academic alternative or little

reward must be perceived to accrue to competing alternatives. It can be hypothesized that:

H. 3.18 Among students with the same academic aptitude, those achieving at a higher grade point level perceive greater reward relative to academic activity than those students achieving at a lower grade point level.

It can also be hypothesized that:

H. 3.19 Among students with the same academic aptitude, those achieving at a higher grade point level perceive less reward relative to alternative activity competing with academic activity.

Level of Student Image

A student image is the perceptual organization of self relevant data abstracted from significant interaction and others within the student role. Within this role teachers are a prescribed audience of evaluation and as such are significant others for every student at least to the prescribed marginal level. Due to the prescribed significance of teachers it is necessary that a student's self image be abstracted in part from his perceptions of teachers' observations and evaluations of him as a student. Thus a positive relationship can be expected between what a student perceives teachers to think of him and his own self image as a student. (This is closely akin to Cooley's concept of the looking glass self.)[1] His maintenance and enhancement needs as a student are based upon his student image. His achievement as a student is motivated by these needs. Thus there can also be expected a positive relationship between the achievement level of a student and his perceptions of what his teachers think of him as a student. It can be hypothesized that:

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[1]Charles H. Cooley, Human Nature and the Social Order (New York: Scribner's, 1902).

H. 3.20 Students achieving at a high or enhancement level perceive that teachers think of them in terms which are self enhancing and generally highly valued within the student role.

It can also be hypothesized that:

H. 3.21 Students achieving at a low grade point level perceive that teachers think of them in terms that are more common and not generally highly valued within the student role.

It can further be hypothesized that:

H. 3.22 Students at the highest grade point level perceive that teachers think of them in terms that are both highly valued within the student role and also unique.

Significant Others

The maintenance and enhancement of self depends upon data abstracted from interaction and others. Individuals from whom self relevant data is abstracted are called significant others. If a student's significant others value grade point average highly and thus reward the attainment of it by esteem and approval the total reward perceived to accrue to attainment of grade point average rises. When reward accruing to an activity is high that activity is apt to be chosen over competing alternative activities. It can be hypothesized that:

H. 3.23 Students whose significant others value the attainment of grade point average are more often students achieving at a high level than students achieving at a low level.

Summary

In this chapter grade point average is chosen as a criterion of academic achievement and aptitude is chosen as a criterion upon which expected grade point average is predicted. It is assumed that factors other than aptitude operate in determining level of academic output

and grade point average. These other factors behind the differences in academic output among students are said to be motivational factors.

Students are differentiated on two bases, achievement or grade point and on motivation level. Students who differ on grade point are simply students receiving different grade point averages due to aptitude or motivational differences. Students who differ in motivation are students whose grade point is above or below its expected level as predicted by aptitude. Those above expected level are highly motivated (expended many units of academic output) while those below expected level are low in motivation (expended few units of academic output).

Students are analyzed relative to these criterion in the framework of the constructs presented in chapter two. From this analysis a series of hypotheses are made about characteristics of students differing in grade point and in motivation. These hypotheses will be tested in chapter five of this study.

CHAPTER IV

DESIGN AND METHODOLOGY

The design and methodology of this study are presented in five sections: 1) instrumentation, 2) item selection, 3) sample selection, 4) item analysis, and 5) academic achievement characteristic analysis.

Instrumentation

It is the purpose of the investigation which follows to serve as a pilot study of the constructs presented in chapter two by a test of the hypotheses formulated in chapter three. To this end four instruments are employed.[1] The instruments are those developed by Farquhar[2] and associates at Michigan State University primarily from characteristics reported by previous investigators to be related to academic achievement. These four instruments are composed of a total of five hundred and eight objective type items. The instruction sheets and a sample item from each instrument can be found in Appendix A.

Item Selection

For the purpose of this pilot study the items on the four Farquhar instruments were examined for relevance to the hypotheses presented

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[1]Human Trait Inventory, Generalized Situational Choice Inventory, Preferred Job Characteristics Scale and Word Rating List.

[2]Farquhar, op. cit.

in chapter three. An item was selected for inclusion if a logical or psychological inference could be drawn from one of the hypotheses formulated in chapter three relative to direction of response to the item. The items selected on this basis clustered into groups around the hypothesis which served as the source of inference to direction of response. Items to which no inference could be drawn from the theory of this study and items which did not constitute a group around a hypothesis large enough to serve as a sub scale of the instrument were eliminated from consideration in this study. In all, one hundred and eighty one items grouped into eleven different sub scales were selected. These instruments were administered by Farquhar and associates to eleventh grade students in nine high schools in Michigan. From this population of over forty two hundred students the four criterion groups used in this study were statistically selected on the basis explained below.

Sample Selection

Farquhar used the following procedures in sample selection.

1) A survey of high schools in the 100 largest populated cities was made to determine the nature of their testing program.

2) Nine high schools in eight Michigan cities, having 9th grade Differential Aptitude Test scores available on their current 10th graders, were contacted and asked to cooperate in the study.

3) A second aptitude measure was obtained so that reliable estimates of academic aptitude could be made. California Tests of Mental Maturity were administered while the students were in the 10th grade. Administration was necessary in all but one of the schools.

4) Grade point averages (GPA) were calculated using grades in 9th and 10th grade subjects. Only academic subjects were included, i.e. those requiring homework. Activity courses were eliminated from the calculations.

5) The DAT--Verbal Reasoning and CTMM--Language sub-test scores were used in obtaining a stable estimate of academic

aptitude after empirically examining possible DAT and CTMM sub-score combinations.

6) Regression lines were calculated for each school and sex assuming a correlation of +1.00 between DAT-VR and CTMM-L. Separate equations were calculated because a pilot study indicated that one was not applicable across schools. Only those individuals who fell within one standard error of estimate above and below the regression line were included in the study. Because it was important that the criterion groups be classified with little chance of making a Type II error (accepting when should have rejected), it was decided to run the risk of a Type I error (reject when should have accepted) even if sample were lost in the process.[1] (See figure 4.1.)

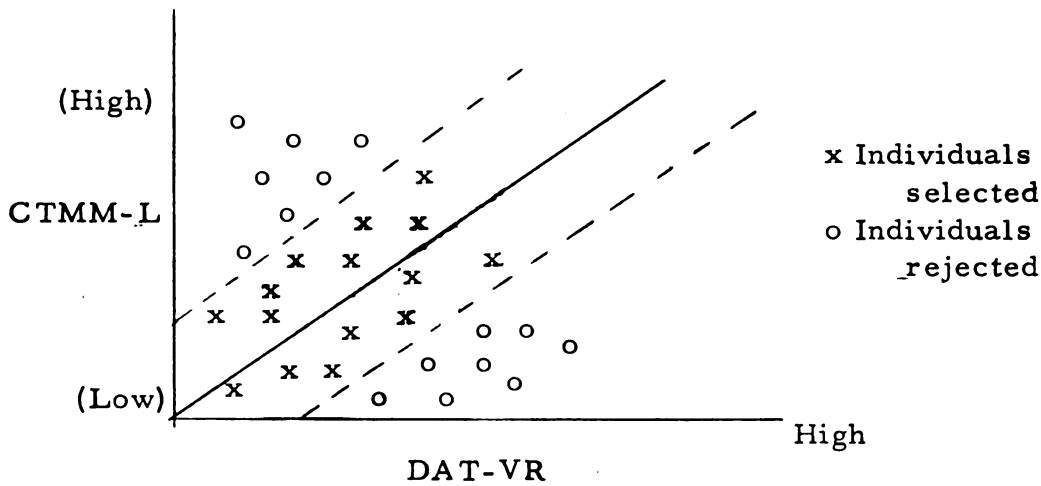

Figure 4.1. Selection of individuals with stable measured aptitude.

Selection on Motivation

A pilot study was conducted to determine the effectiveness of grade point average for these students by both the DAT-VR and the CTMM-L sub test scores. The correlation of the DAT-VR with grade point average was found to be +.65 and that of the CTMM-L and grade point average to be +.50. Due to its greater effectiveness as a predictor of

[1]David A. Payne, A Dimension Analysis of the Academic Self-Concepts of Eleventh Grade Under and Over Achieving Students. Doctoral Dissertation, Michigan State University, 1961, pp. 31-32.

grade point average the DAT-VR was used as the independent variable in constructing regression equations predicting grade point average. Equations were calculated for each sex within each school. On this basis under and over achieving students were identified and selected. Under achievers were defined as students whose grade point average fell one standard error of estimate or more below the regression line prediction of achievement. Over achievers were defined as students whose grade point averages fell one standard error of estimate or more above the regression line. These students were assumed, based on the constructs already presented in chapters two and three, to differ significantly in academic achievement characteristics. The over achievers were assumed to have expended greater output units of academic achievement than the under achievers and thus to be more highly motivated. Over achievers then can be considered as high in motivation and under achievers as low in motivation, at least comparatively. (See Figure 4.2.)

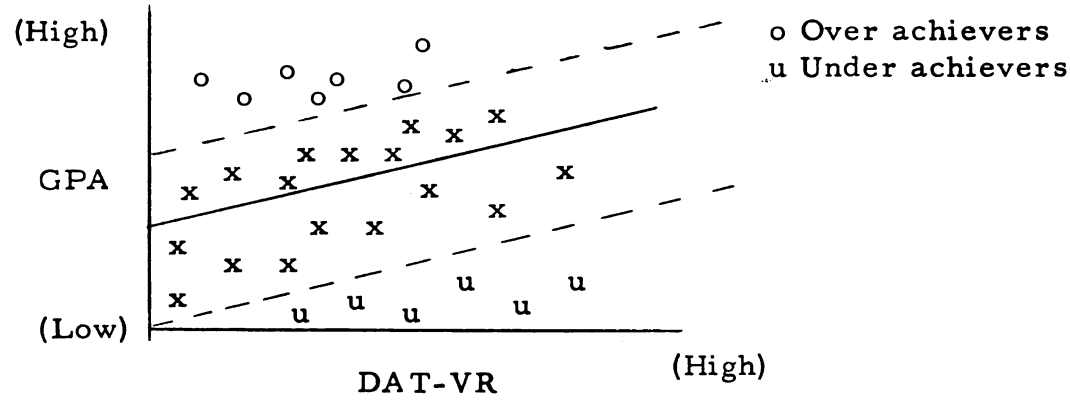

Figure 4.2. Method of selecting over and under achievers.

Approximately twelve percent of the present population of eleventh graders were selected as over and under achievers. The samples selected consisted of 167 male over achievers and 131 male under achievers and 191 female over achievers and 170 female under achievers on whom results on the four instruments administered by Farquhar were available.

Sex Differences

The present study is heavily based on self concept theory and constructs closely related to self concept. Many investigators have reported significant differences between male and female responses to measures of self concept. Brookover,[1] Shaw,[2] Davidson and Lang,[3] Sarbin and Rosenberg[4] and Rosen[5] are among those reporting such sex differences. Because of these sex differences the present study is concerned only with male over and under achievers. Subsequent studies will explore the structure of female motivation.

Selection on Achievement Level

Over achievers were defined as being highly motivated and under achievers as being low in motivation. The theory and constructs presented in Chapters Two and Three led to hypotheses of differences in academic achievement characteristics among groups of students based on motivational level and also upon level of achievement or position on the grade point continuum. For this reason, it was not sufficient to

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[1]Wilbur S. Brookover, A. Valinsky, and S. Thomas, "Relationship of Self Images to Achievement in Junior High School Students." Paper read to Annual Meeting of American Educational Research Association, Chicago, February, 1961.

[2]Merville C. Shaw, K. Edson, and H. M. Sell, "The Self Concept of Bright Underachieving High School Students as Revealed by an Adjective Check List," Personnel and Guidance Journal, Vol. 39, 1960, pp. 193-196.

[3]Helen H. Davidson and G. Lang, "Children's Perceptions of Their Teachers' Feelings Toward Them Related to Self-Perception, School Achievement and Behavior," Journal of Experimental Education, Vol. 29, 1960, pp. 107-118.

[4]T. R. Sarbin and B. G. Rosenberg, "Contributions to Role-Taking Theory: IV A Method for Obtaining a Qualitative Estimate of Sex," Journal of Social Psychology, Vol. 42, 1955, pp. 71-81.

[5]E. Rosen, "Self Appraisal and Perceived Desirability of M. M. P. I. Traits," Journal of Counseling Psychology, Vol. 3, 1956, pp. 44-51.

select groups of students that differed only on level of motivation. It was necessary also to select groups of students that differed on grade point average. To this end, the mean grade point average of all males within each school was estimated from a random sample of approximately thirty percent of the male students in each school. Each over and under achieving student's grade point average was then transformed into standard deviation units. Over achievers were ranked on grade point average as were under achievers.

The thirty five over achievers with the highest grade point deviation scores were selected as high over achievers. The thirty five over achievers with the lowest grade point deviation scores were selected as low over achievers. The thirty five under achievers with the highest grade point deviation scores were selected as high under achievers. The thirty five under achievers with the lowest grade point deviation scores were selected as low under achievers. (See Figure 4.3.)

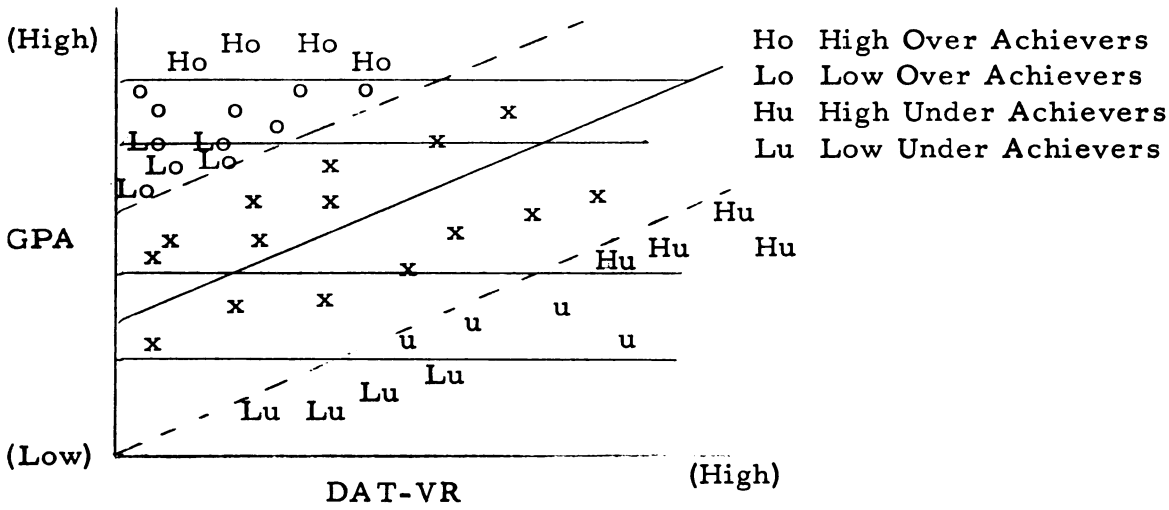

Figure 4.3. Method of selection of four criterion groups of students.

The range, mean, and median grade point deviation scores were figured for each of the four groups and are presented in Table 4.1 on the following page.

Table 4.1. Range, Median and Mean Grade Point Deviation Scores for the Four Criterion Groups of Students

Students	Range	Median	Mean
High Over	+2.93 to +2.02	+2.47	+2.40
Low Over	- .51 to + .66	+ .31	+ .25
High Under	+ .53 to - .77	- .41	- .35
Low Under	-3.00 to -1.48	-1.72	-1.77

Description of Differences Between Criterion Groups

The differences between each criteria group should be specifically noted for it is on the basis of these differences that the hypotheses will be tested and results interpreted. There are six possible comparisons between groups. For this reason contrast of each of these pairs of groups will be considered. For comparison of mean grade point levels t tests were used in each instance.

High Over and Low Over Achievers

High over achievers differ from low over achievers on grade point level. The mean grade point level of high over achievers is 2.15 standard deviations above the mean grade point level of low over achievers. The difference is significant at the .01 level.

Students in both groups are achieving more than one standard error above the level predicted by aptitude and are thus assumed to be highly motivated. Because motivation level of both groups is high, no differences between the two groups on motivation will be hypothesized. For this reason, differences between groups will be largely attributed to grade point level which is established as significantly different.

High Over and High Under Achievers

High over achievers differ from high under achievers on grade point level. The mean grade point level of high over achievers is 2.75 standard deviations above the mean grade point level of high under achievers. This difference is significant at the .01 level.

The two groups also differ on motivation level. High over achievers are achieving one standard error or more above the level predicted by aptitude while high under achievers are achieving one standard error or more below the level predicted by aptitude.

Differences between high over and high under achievers can thus be attributed to either difference in grade point level or difference in motivation level, or both.

High Over and Low Under Achievers

High over achievers differ from low under achievers on grade point level. The mean grade point level of high over achievers is 4.17 standard deviations above the mean grade point level of low under achievers. This difference is significant at the .01 level.

The two groups also differ on motivation level. High over achievers are achieving one standard error or more above the level predicted by aptitude while low under achievers are achieving at a level one standard error or more below the level predicted by aptitude.

Differences between high over and low under achievers can thus be attributed to either difference in grade point level or difference in motivation level, or both.

Low Over and High Under Achievers

The difference in mean grade point level between low over and high under achievers is .60 of a standard deviation and was found to be significant at the .01 level. The statistically significant difference between

these two means if interpreted after inspectional analysis of the data to be due in large measure to the homogeneity of each of the two groups. The homogeneity greatly restricts the range of grade point which makes the variance within each group extremely small. The small variance in turn makes the estimated standard error of the difference between means extremely small. The use of the small standard error in the t test is largely responsible for the significance of a mean difference of only .60 of a standard deviation. For this reason it is proposed that, in spite of the statistically significant difference in mean grade point level between the two groups, low over and high under achievers are not sociologically or psychologically sufficiently different respective to grade point level to cause significant differences in perception of student image or to perception of facets of education and school related to student image.

The above position is based on the following four considerations. 1) Of the total grade point range of the two groups 74.6 percent overlap. 2) The mean grade point level of the low over achievers is within one fourth of one standard deviation above the general average grade point mean. The mean grade point level of high under achievers is within thirty five hundredths of one standard deviation below the general average grade point mean. The two means are thus only six tenths of one standard deviation apart in both directions from the general mean. Both groups then are close to the over all average grade point level and the difference between them is in both directions from this average grade point level. 3) Assuming grade point average within the nine schools from which these students were selected to be normally distributed, both mean grade point levels are within the middle thirty percent of all students. 4) Of the 35 low over achievers, the grade point deviations of 30 are within the grade point range of the high under achievers. Of the 35 high under achievers, the grade point deviations of 21 are within the grade point range of the low over achievers. Thus 51 of the seventy students classified in the two groups fall within the range of the other group.

It is further argued that because the means of these two groups are within the middle third of all students both groups will be looked upon and will perceive themselves as average students. Neither group will be either far enough above or below average to elicit rewards, punishments or other special evaluations or to engage in special interactions within the student role which could be considered at a level other than average. For the above reasons, the low over achievers and the high under achievers will not be considered to differ respective to the effects which grade point level might have on perceptions of student image or perceptions related to the student role.

Low over achievers and high under achievers differ on motivation level. Low over achievers are achieving at a level one standard error or more above the level predicted by aptitude while high under achievers are achieving at a level one standard error or more below the level predicted by aptitude.

Differences between low over and high under achievers will be attributed to the difference in motivation level which has been established due to their discrepant achievement levels relative to aptitude.

Low Over and Low Under Achievers

Low over achievers differ from low under achievers on grade point level. The mean grade point level of low over achievers is 2.02 standard deviations above the mean grade point level of low under achievers. This difference is significant at the .01 level.

These two groups also differ on motivation level. Low over achievers are achieving one standard error or more above the level predicted by aptitude while low under achievers are achieving one standard error or more below the level predicted by aptitude.

Differences between low over and low under achievers can thus be attributed to either difference in grade point level or difference in motivation level, or both.

High Under and Low Under Achievers

High under achievers differ from low under achievers on grade point level. The mean grade point level of high under achievers is 1.42 standard deviations above the mean grade point level of low under achievers. This difference is significant at the .01 level. These two groups are both assumed to be low in motivation due to the fact that students in both groups are achieving more than one standard error below the level predicted by aptitude. Because there is no measure of amount of motivation beyond the nominal classifications of the study it can not be determined whether these two groups differ on motivation level. Because motivation level of both groups is low, no differences between the two groups on motivation will be assumed. For this reason, any obtained differences will be largely attributed to the contrasts in grade point level which is known and established as significant.

In Table 4.2 is presented a summary of the postulated differences between each of the six possible group comparisons.

Table 4.2. Summary of Grade Point Level and Motivation Levels of the Four Criterion Groups in Six Pairs

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers

Groups Paired	Hypothesis of Motivation Level	Hypothesis of Grade Point Level
HO-LO	HO = LO	HO > LO
HO-HU	HO > HU	HO > HU
HO-LU	HO > LU	HO > LU
LO-HU	LO > HU	LO = HU
LO-LU	LO > LU	LO > LU
HU-LU	HU = LU	HU > LU

*For graphic description of groups see figure 4.3.

Item Analysis

Each of the one hundred and eighty one items selected for study were scored for each student in each of the four criterion groups. The four point responses on the questions from the Human Trait Inventory and the Word Rating List were dichotomized. Responses one and two were scored in one direction and responses three and four were scored in the opposite direction. All items were scored giving "one" for a response predicted to be indicative of higher motivation and/or achievement level students and "zero" for every response predicted to be indicative of lower motivational and/or achievement level students. Response frequencies were calculated for every item for each of the four criterion groups. These response frequencies were entered into a 2x2 contingency table and the Chi-square values determined. Fisher's test of exact probability was used when any cell expected frequency was less than five. The analysis took the form of finding which items discriminated between the two criterion groups being compared. The level of significance was set at .10 and was also reported at .05 and .01 if these levels were found. A less stringent level (i.e. .20 level) would have been chosen if cross validation were possible. This was not feasible due to the uniqueness of each group which severely limited available sample. On the other hand a more stringent significance level would have raised the possibility of not rejecting the null hypothesis of no difference when a real difference did in fact exist. Thus the .10 level was chosen.

Analysis of Academic Achievement Characteristics

Each of the one hundred and eighty one items is grouped into one of eleven academic achievement characteristics based on the hypothesis from which the direction of response was predicted. Each academic achievement characteristic constitutes a logically and psychologically

defined characteristic assumed to be related to academic achievement level and or motivation level. In order to determine the degree of difference between each group on each academic achievement characteristic the mean scores were computed. The means were analyzed by Duncan's Multiple Range Test as suggested by Edwards.[1] Furthermore, the F max test for homogeneity of variance was calculated for each academic achievement characteristic. Where variance was found to be significantly heterogeneous at the .01 level Duncan's test was not used. Instead, t tests with weighted variance estimates based on the two groups being compared and Welch's formula for degrees of freedom were used. All tests were one tailed and made at the .05 significance level.

Analysis of Total Instrument

All items were assumed to constitute one instrument that measured factors associated with academic achievement level and or academic motivation level. To determine the degree of difference between groups the total instrument means were calculated. The means were tested by t tests using weighted estimates based on the two groups being compared and Welch's formula for degrees of freedom. All tests were one tailed and made at the .05 significance level.

Reliability

A reliability estimate based on Hoyt's[2] analysis of variance technique was made for the total instrument over all groups and for each academic achievement characteristic for each group.

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[1]Allen L. Edwards, Experimental Design in Psychological Research (New York: Rinehart and Company, 1960), pp. 136-139.

[2]Cyril Hoyt, "Test Reliability Obtained by Analysis of Variance," Psychometrika, Vol. 6, 9141, pp. 153-160.

Summary

A discussion of the one hundred and eighty one items used in this study and the method of their selection was presented. Selection of the four criterion groups, High Over, Low Over, High Under, and Low Under achievers was discussed and the groups were described statistically. A description of differences between each of the six possible pairs of these groups was given. Chi square was chosen as the appropriate tool for item analysis. Duncan's Multiple Range test was chosen as a test of each of the eleven academic achievement characteristics except where heterogeneity of variance indicated the use of t tests. The same analysis procedures were suggested for the total instrument. Lastly, Hoyt's analysis of variance technique was selected for estimating internal consistency of each academic achievement characteristic sub scale and the total instrument.

CHAPTER V

ANALYSIS OF DATA

In this chapter the analysis of data is presented in twelve sections. There is one section for each of the eleven theorized academic achievement characteristics on which a measure was made. The last section is devoted to an analysis of the total of the eleven characteristics. Within each section the results are presented in the order which follows.

1) A short description of the characteristic is given.

2) A chi-square analysis of the responses of each of the three criterion groups compared with each of the other three criterion groups on each item within the characteristic scale is presented.

All items are scored in the direction of the response theorized to characterize the higher level student. All items reported significant are significant in the predicted direction unless otherwise noted. For all items, the rank order of the response frequency is given with rank one assigned to the group having the highest response frequency.

3) An estimate of the reliability, made by Hoyt's analysis of variance technique,[1] is presented for each of the criterion groups on the characteristic scale.

4) Individual comparisons between the mean response scores of each of the criterion groups compared with each of the other three criterion groups are presented for each characteristic scale. An F max test for homogeneity of variance is run on each of the characteristic scales and the total scale. Scales three, eight and nine produce heterogeneity of

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[1]Cyril Hoyt, "Test Reliability Obtained by Analysis of Variance," Psychometricka, Vol. 6, 1941, pp. 153-160.

variance significant at the .05 level. For comparisons between mean scores on these three scales t tests were made. The weighted variance estimates of the two groups being compared is used as the variance estimate for the comparison. For comparisons on all other scales Duncan's Multiple Range Test[1] is employed. The within variance of the analysis of variance or a pooled variance estimate of the total of the four groups is used as the variance estimate for the comparisons.

In the final section, comparisons between mean scores of each of the criterion groups and each of the other three groups on the total response scores to all of the items making up the eleven characteristic scales are presented.

Characteristic I--Importance of Student Image

Characteristic one is concerned with the student's generalized way of thinking of himself. No distinction is made in these questions between real and disposed dimensions of self. General statements attributable to the total person or to the self concept are presented in pairs. In each pair of attributes one attribute is pertinent to and highly valued in the student role, while the other is an attribute less pertinent to and less highly valued in the student role. Prediction of direction of choice between these pairs of statements is based on the rationale presented on page 35.

Item Analysis

The null hypothesis for item analysis is:

There will be no difference in the response frequency of the populations from which each of the four criterion groups of students are drawn for each of the items on characteristic scale one.

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[1]Allen L. Edwards, Experimental Design in Psychological Research (New York: Rinehart and Company, 1960), pp. 136-139.

The alternative hypotheses stated symbolically relative to response frequency for each item are:

fHO > fLO	fHO > fHU	fHO > fLU
fLO > fHU	fLO > fLU	fHU > fLU

A summary of the item analysis for characteristic scale one is presented in Table 5.1.

Legend

HO = High Over Achievers
LO = Low Over Achievers
HU = High Under Achievers
LU = Low Under Achievers

Numbers 1, 2, 3
One response frequency to item scored in direction indicated

Table 5.1. Summary of Chi-square Analysis of Items--Academic Achievement Characteristic Scale One

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers

Numbers 1, 2, 3, 4 refer to rank order of group response frequency to item scored in direction indicated. One is highest frequency, four is lowest frequency.
Items scored in direction of circled alternative or response number indicated.
* Items reversed predicted direction of difference. GSCI = Generalized Situational Choice Inventory.

GSCI Item No.	I would prefer to:	Chi-squares HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
4 a	Have no outstanding abilities but be liked by others, or		2			4			3			1	
ⓑ	Be able to do things well, even though others didn't like me for it	--	--	--	--	--	.10*	--	--	--	--	.10*	--
11 a	Be thought of as being clever in dealing with people, or		2			3			4			1	
ⓑ	Be thought of as being clever in working with ideas	--	--	--	--	--	.10*	--	--	.05*	--	.10*	.05*
18 ⓐ	Be thought of as being intelligent or		1			2			3			3	
b	Be thought of as being practical	--	--	--	--	--	--	--	--	--	--	--	--
26 ⓐ	Be thought of as being a studious person, or		1			4			2			3	
b	Be thought of as being a care-free person	.10	--	--	.10	--	--	--	--	--	--	--	--
58 a	Be a person of leisure, or		3			3			2			1	
ⓑ	Be a person of action	--	--	--	--	--	--	--	--	--	--	--	--
67 a	Be considered as being strong but not very smart, or		1			3			2			4	
ⓑ	Be considered as being weak but smart	.01	.05	.01	.01	--	--	.05	--	--	.01	--	--

continued

Table 5.1 - Continued

GSCI I would prefer to: Item No.	HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
	Chi-squares											
84a Have average ability and be liked by many people, or (b) Have superior ability but not be liked by as many people		1			3			2			4	
	.10	--	.05	.10	--	--	--	--	--	.05	--	--
90(a) Be known as a person with unusually good ideas, or b Be known as a person who goes along with the crowd		1			2			3			4	
	--	--	.10	--	--	--	--	--	--	.10	--	--
94(a) Be an able person, or b Be a wealthy person		1			3			3			2	
	--	--	--	--	--	--	--	--	--	--	--	--
95a Be thought of as being shrewd, or (b) Be thought of as being intelligent		2			1			3			3	
	--	--	--	--	--	--	--	--	--	--	--	--
117(a) Be thought of as being smart, or b Be thought of as being practical		1			2			2			4	
	--	--	.05	--	--	--	--	--	--	.05	--	--
155a Be thought of as having average intelligence and be wealthy, or (b) Be thought of as being quite intelligent and be poor.		1			4			3			2	
	.05	--	--	.05	--	--	--	--	--	--	--	--
165a Be known as a person who makes the classroom pleasant, or (b) Be known as a person who knows what he is talking about		1			2			4			2	
	.10	.05	.10	.10	--	--	.05	--	--	.10	--	--
167a Be known as being a "good boy" or a "good gal," or (b) Be known as a person who "does things well"		1			2			3			3	
	--	.05	.05	--	--	--	.05	--	--	.05	--	--
196(a) Be the smartest person in the world, or b Be the happiest person in the world		2			1			4			2	
	--	.10	--	--	.05	--	.10	.05	.10	--	--	.10

Item Analysis

Of the fifteen items eleven discriminated between at least two of the criterion groups at the .10 level or better.

Reliability

Table 5.2. Summary of Hoyt's Reliability Estimates on Characteristic Scale One for Each Criterion Group

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
N = Number of Students in Group

Group	N	No. Items	Reliability Estimate
HO	35	15	.71
LO	35	15	.54
HU	35	15	.67
LU	35	15	.27

The reliability estimates ranged from .27 to .71.

Tests of Means

The null hypothesis for characteristic analysis is:

There will be no difference between the mean scores of the populations from which each of the four criterion groups are drawn on characteristic scale one.

Symbolically stated, the alternative hypotheses for characteristic analysis are:

$$\overline{HO} > \overline{LO} \qquad \overline{HO} > \overline{HU} \qquad \overline{HO} > \overline{LU}$$
$$\overline{LO} > \overline{HU} \qquad \overline{LO} > \overline{LU} \qquad \overline{HU} > \overline{LU}$$

A summary of the tests of means for characteristic one is presented in Table 5.3.

Table 5.3. Summary of Duncan's Multiple Range Tests for Characteristic Scale One

Legend:	HO = High Over Achievers LO = Low Over Achievers			HU = High Under Achievers LU = Low Under Achievers		
	Means	HU 7.97	LU 8.00	LO 8.20	HO 9.71	Shortest Significant Range (.05 level)
HU	7.97	--	.03	.23	1.74	1.29
LU	8.00	--	--	.20	1.71	1.36
LO	8.20	--	--	--	1.51	1.40
		HU	LU	LO	HO	

Of the six comparisons made three were significant at the .05 level.

Characteristic II--Level of Self Concept

Characteristic two is concerned with the student's generalized maintenance and enhancement needs. Items from the G.S.C.I. present general statements in pairs. One statement presents a description of an enhancement alternative while the other alternative is at the maintenance level. Items from the H.T.I. present either a maintenance or an enhancement alternative with choice based on frequency. Prediction of direction of choice of these statements is based on the rationale presented on page 37 chapter three.

Item Analysis

The null hypothesis for item analysis is:

> There will be no difference in the response frequency of the populations from which each of the four criterion groups of students are drawn for each of the items on characteristic scale two.

The alternative hypotheses stated symbolically relative to response frequency for each item are:

fHO > fLO	fHO > fHU	fHO > fLU
fLO > fHU	fLO > fLU	fHU > fLU

A summary of the item analysis for characteristic scale two is presented in Table 5.4.

Table 5.4. Summary of Chi-square Analysis of Items--Academic Achievement Characteristic Scale Two

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
Numbers 1, 2, 3, 4 refer to rank order of group response frequency to item scored in direction indicated.
One is highest frequency, four is lowest frequency.
Items scored in direction of circled alternative or response number indicated.
* Items reversed predicted direction of difference. GSCI = Generalized Situational Choice Inventory.

GSCI Item No. — I would prefer to:	HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
	Chi-squares											
36 (a) Be able to do difficult things better than other people, or b Be able to do difficult things just as well as other people	1 .01	 .10	 .01	3 .01	 --	 --	2 .10	 --	 .05	4 .01	 --	 .05
38 (a) Be known as a person who can solve problems better than anyone else, or b Be known as a person who can solve problems well	1 .01	 --	 .01	3 .01	 .05*	 --	2 --	 .05*	 .05	3 .01	 --	 .05
45 (a) Develop a new product which may or may not be good, or b Make a product as good as the best one available	1 .05	 .01	 .01	2 .05	 --	 --	3 .01	 --	 --	4 .01	 --	 --
50 (a) Be successful in finishing a job, or b Finish a job	1 --	 --	 .01	2 --	 --	 .10	3 --	 --	 --	4 .01	 .10	 --
62 a Receive grades which are like everyone elses', or (b) Receive grades that please my parents	1 .10	 .10	 .01	2 .10	 --	 .05	2 .10	 --	 .05	4 .01	 .05	 .05
70 (a) Be known as a person with much ability, or b Be known as a person with adequate ability	1 .01	 .05	 .01	3 .01	 --	 --	2 .05	 --	 --	4 .01	 --	 --

Table 5.4 - Continued

GSCI Item No.	I would prefer to:	Chi-squares											
		HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
73 (a)	Be paid for how well I did a job, or		1			3			2			4	
b	Be paid the same amount no matter how I did the job	.01	.05	.01	.01	--	--	.05	--	--	.01	--	--
96 (a)	Be paid for the amount of work I did, or		1			3			2			4	
b	Be paid by the hour	.01	.05	.01	.01	--	--	.05	--	--	.01	--	--
97 a	Be comfortable and get what I want now, or		1			3			2			4	
(b)	Be comfortable and get what I want in the future	--	--	.10	--	--	--	--	--	--	.10	--	--
128 a	Do things as other people would do them, or		1			4			2			3	
(b)	Do things better than other people	.01	--	.05	.01	.10*	--	--	.10*	--	.05	--	--
136 (a)	Plan my life in advance, or		1			2			4			3	
b	Live my life from day to day	.05	.01	.01	.05	.10	--	.01	.10	--	.01	--	--
175 a	Do something like everyone else, or		1			3			2			4	
(b)	Do something outstanding	.05	.10	.01	.05	--	--	.10	--	.05	.01	--	.05

continued

Table 5.4 - Continued

HTI = Human Trait Inventory

HTI Item No.	1 Never 2 Sometimes Ratings 3 Usually 4 Always	HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
		Chi-squares											
93	I want very much to be a success (3, 4)	1 --	1 .05	1 .01	2 --	2 .05	2 .01	3 .05	3 .05	3 --	4 .01	4 .01	4 --
110	I like to plan my activities in advance (3, 4)	1 .01	1 .05	1 .05	4 .01	4 --	4 --	2 .05	2 --	2 --	2 .05	2 --	2 --
111	It is more fun if your activities are not planned out in advance (1, 2)	1 --	1 --	1 --	4 --	4 --	4 --	3 --	3 --	3 --	2 --	2 --	2 --
120	I feel that I haven't any goals or purpose in life (1, 2)	1 --	1 --	1 .05	3 --	3 --	3 --	2 --	2 --	2 --	4 .05	4 --	4 --

Item Analysis

Of the sixteen items fifteen discriminated between at least two of the criterion groups at the .10 level or better.

Reliability

Table 5.5. Summary of Hoyt's Reliability Estimates on Characteristic Scale Two for Each Criterion Group

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
N = Number of Students in Group

Group	N	No. Items	Reliability Estimates
HO	35	16	.52
LO	35	16	.25
HU	35	16	.50
LU	35	16	.30

The reliability estimates ranged from .25 to .52.

Test of Means

The null hypothesis for characteristic analysis is:

There will be no difference between the mean scores of the populations from which each of the four criterion groups are drawn on characteristic scale two.

Symbolically stated, the alternative hypotheses for characteristic analysis are:

$\overline{HO} > \overline{LO}$ $\quad \overline{HO} > \overline{HU}$ $\quad \overline{HO} > \overline{LU}$
$\overline{LO} > \overline{HU}$ $\quad \overline{LO} > \overline{LU}$ $\quad \overline{HU} > \overline{LU}$

A summary of the tests of means for characteristic two is presented in Table 5.6.

Table 5.6. Summary of Duncan's Multiple Range Tests for Characteristic Scale Two

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers

		LU	LO	HU	HO	Shortest Significant Range
	Means	9.31	10.26	11.03	13.86	(.05 level)
LU	9.31	--	.95	1.72	4.55	1.12
LO	10.26	--	--	.77	3.60	1.18
HU	11.03	--	--	--	2.83	1.22
		LU	LO	HU	HO	

Of the six comparisons made four were significant at the .05 level.

Characteristic III--Level of Student Image

Characteristic three is concerned with the student's maintenance and enhancement needs relative to his student image. Statements of alternatives specifically related to education are presented in pairs. One statement presents an alternative at the enhancement level and the other an alternative at the maintenance level. Prediction of direction of choice between these pairs of alternatives is based on the rationale presented on page 39 chapter three.

Item Analysis

The null hypothesis for item analysis is:

> There will be no difference in the response frequency of the populations from which each of the four criterion groups of students are drawn for each of the items on characteristic scale three.

The alternative hypotheses stated symbolically relative to response frequency for each item are:

fHO > fLO	fHO > fHU	fHO > fLU
fLO > fHU	fLO > fLU	fHU > fLU

A summary of the item analysis for characteristic scale three is presented in Table 5.7.

Table 5.7. Summary of Chi-square Analysis of Items--Academic Achievement Characteristic Scale Three

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
Numbers 1, 2, 3, 4 refer to rank order of group response frequency to item scored in direction indicated.
One is highest frequency, four is lowest frequency.
Items scored in direction of circled alternative or response number indicated.
* Items reversed predicted direction of difference. GSCI = Generalized Situational Choice Inventory

GSCI Item No.	I would prefer to:	HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
		Chi-squares											
2 a	Avoid failing in school, or		1			3			2			4	
ⓑ	Do well in school	--	--	.01	--	--	.10	--	--	.05	.01	.10	.05
37 a	Be well prepared for a job after graduation from high school, or		1			3			2			4	
ⓑ	Be well prepared to continue learning	.01	.01	.01	.01	.01*	.05	.01	.01*	.01	.01	.05	.01
41 a	Pass a usual classroom examination, or		1			3			2			4	
ⓑ	Pass a college entrance examination	.05	--	.01	.05	--	.01	--	--	.01	.01	.01	.01
44 a	Have the teacher give everyone the same grade at the beginning of the term and know I had passed, or		1			2			3			4	
ⓑ	Take chances on getting a higher or lower grade at the end of the course	.05	.05	.01	.05	--	.05	.05	--	.10	.01	.05	.10

continued

Table 5.7 - Continued

GSCI Item No.	I would prefer to:	HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
					Chi-squares								
52 ⓐ	Get excellent grades because I have a great deal of ability, or		1			3			2			4	
b	Get average grades because I have average ability	.01	.01	.01	.01	--	.05	.01	--	.01	.01	.05	.01
53 ⓐ	Be graded at the end of a course with the possibility of making an "A," or		1			2			2			4	
b	Get a "C" at the beginning of a course along with everyone else	.01	.01	.01	.01	--	.05	.01	--	.05	.01	.05	.05
55 a	Get one of many "C's" in a course and learn something, or		1			2			4			2	
ⓑ	Get the only "A" and not learn as much	.10	.01	.10	.10	--	--	.01	--	--	.10	--	--
63 a	Do as well as most of my classmates, or		1			3			2			4	
ⓑ	Do better than most of my classmates	.01	.05	.01	.01	--	.10	.05	--	.01	.01	.10	.01
65 a	Study hard enough just to get by, or		1			3			2			4	
ⓑ	Study hard enough to do very well	.05	--	.01	.05	--	--	--	--	.05	.01	--	.05

continued

Table 5.7 - Continued

GSCI Item No.	I would prefer to:	Chi-squares HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
86 a	Have everybody in the class get a "C" at the beginning of the course, or		1			3			2			4	
ⓑ	Be graded at the end of the course with the possibility of getting a higher or lower mark	.01	.01	.01	.01	--	--	.01	--	--	.01	--	--
88 ⓐ	Receive a grade on the basis of how much my teacher thinks I have learned, or		1			3			2			4	
b	Take a course from an instructor who only gives "C's"	--	--	.01	--	--	.01	--	--	.01	.01	.01	.01
132 ⓐ	Wait until I have finished college and make a better salary, or		1			3			2			4	
b	Get a job right after high school and make a good salary	.01	.01	.01	.01	--	--	.01	--	--	.01	--	--
141 ⓐ	Study to go to college, or		1			3			2			4	
b	Study to get out of high school	.01	.05	.01	.01	.01	--	.05	.01	.01	.01	--	.01
159 a	Help my friends pass an examination and receive a "C" myself, or		1			2			2			4	
ⓑ	Study alone and receive an "A" on the examination	.10	.10	.05	.10	--	--	.10	--	--	.05	--	--

continued

Table 5.7 - Continued

GSCI Item No.	I would prefer to:	Chi-squares HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
181 ⓐ	Receive the only "A" in a class, or		1			3			2			4	
b	Receive the same grades as most of the students in my classes	.01	.05	.01	.01	--	--	.05	--	.10	.01	--	.10
190 ⓐ	Work hard enough to be outstanding, or		1			3			2			4	
b	Work hard enough to pass my courses	.01	.01	.01	.01	--	--	.01	--	--	.01	--	--
PJCS Item No.	I would prefer:	PJCS = Preferred Job Characteristic Scale											
5 a	A job which does not require a college education		1			3			2			4	
ⓑ	A job where I could decide how the work is to be done	.01	--	.01	.01	.10*	--	--	.10*	.05	.01	--	.05
12 ⓐ	A job where I solve problems no one else can		1			3			2			4	
b	A job which does not require a college education	.01	.01	.01	.01	--	.10	.01	--	.05	.01	.10	.05
19 a	A job which does not require a college education		1			3			2			4	
ⓑ	A job which has high work standards	.01	.01	.01	.01	.10*	--	.01	.10*	.01	.01	--	.01

continued

Table 5.7 - Continued

PJCS Item No.	I would prefer:	Chi-squares HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
26 ⓐ	A job where I could become known for outstanding accomplishments		1			3			2			4	
b	A job which does not require a college education	.01	.05	.01	.01	--	--	.05	--	.05	.01	--	.05
33 a	A job which does not require a college education		1			3			2			4	
ⓑ	A job where my opinion is valued	.01	--	.01	.01	--	--	--	--	.01	.01	--	.01
48 a	A job which does not require a college education		1			3			2			4	
ⓑ	A job which absorbs my interests	.05	--	.01	.05	--	.10	--	--	.05	.01	.10	.05
55 a	A job which does not require a college education		1			3			2			4	
ⓑ	A job where I could continue to learn the rest of my life	.01	--	.01	.01	--	--	--	--	.05	.01	--	.05
62 a	A job which does not require a college education		1			3			2			4	
ⓑ	A job where I could express my ideas, talents, skills	.05	--	.01	.05	--	--	--	--	--	.01	--	--

Item Analysis

Of the twenty four items all discriminated between at least two of the criterion groups at the .10 level or better.

Reliability

Table 5.8. Summary of Hoyt's Reliability Estimates on Characteristic Scale Three for Each Criterion Group

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
N = Number of Students in Group

Group	N	No. Items	Reliability Estimates
HO	35	24	.79
LO	35	24	.88
HU	35	24	.91
LU	35	24	.83

The reliability estimates ranged from .79 to .91.

Tests of Means

The null hypothesis for characteristic analysis is:

There will be no difference between the mean scores of the populations from which each of the four criterion groups are drawn on characteristic scale three.

Symbolically stated, the alternative hypotheses for characteristic analysis are:

$$\overline{HO} > \overline{LO} \qquad \overline{HO} > \overline{HU} \qquad \overline{HO} > \overline{LU}$$
$$\overline{LO} > \overline{HU} \qquad \overline{LO} > \overline{LU} \qquad \overline{HU} > \overline{LU}$$

A summary of the tests of means for characteristic three is presented in Table 5.9.

Table 5.9. Summary of One Tailed t Tests for Mean Difference Between Criterion Groups on Characteristic Scale Three

Legend: HQ = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
* Significant in reverse of predicted direction.

Means Compared	t Value	Significant at .05 level
HQ > LO	6.82	Yes
HO > HU	5.12	Yes
HO > LU	12.27	Yes
*HU > LO	1.87	Yes
LO > LU	3.11	Yes
HU > LU	5.41	Yes

Of the six comparisons all were significant at the .05 level.

Characteristic IV--Level of Uniqueness

Characteristic four is concerned with the student's need for uniqueness in general and uniqueness of student image relative to education. Such uniqueness is considered to be at a very high enhancement level. Statements of alternatives are presented in pairs. One statement presents a unique enhancement alternative and the other a more common enhancement or a maintenance alternative. Prediction of direction of choice between these pairs of alternatives is based on the rationale presented on page 42 chapter three.

Item Analysis

The null hypothesis for item analysis is:

There will be no difference in the response frequency of the populations from which each of the four criterion groups of students are drawn for each of the items on characteristic scale four.

The alternative hypotheses stated symbolically relative to response frequency for each item are:

fHO > fLO	fHO > fHU	fHO > fLU
fLO > fHU	fLO > fLU	fHU > fLU

A summary of the item analysis for characteristic scale four is presented in Table 5.10.

Table 8.10: Summary of the significant findings of the [illegible] Achievement Orientation Scale Test

Legend: *HO = High Over Achievers*
LO = Low Over Achievers
HU = High Under Achievers
LU = Low Under Achievers
Mean frequency to item scored in direction indicated.

Table 5.10. Summary of Chi-square Analysis of Item s--Academic Achievement Characteristic Scale Four

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
Numbers 1, 2, 3, 4 refer to rank order of group response frequency to item scored in direction indicated.
One is highest frequency, four is lowest frequency.
Items scored in direction of circled alternative or response number indicated.
*Items reversed predicted direction of difference. GSCI = Generalized Situational Choice Inventory.

GSCI Item No.	I would prefer to:	Chi-squares HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
27 a	Receive one of several "A's" in class, or		1			4			2			3	
ⓑ	Receive the highest test grade and get the only "A"	.01	.05	.01	.01	.10*	--	.05	.10*	--	.01	--	--
31 ⓐ	Be the holder of one state record, or		2			1			2			4	
b	Be the holder of several city records	--	--	--	--	--	--	--	--	--	--	--	--
54 a	Be thought of as a person with usual ideas, or		1			4			2			3	
ⓑ	Be thought of as a person with unusual ideas	.01	--	.05	.01	.05	--	--	.05	--	.05	--	--
99 a	Work with a group on an ordinary project which other groups in the class are working on, or		1			3			2			4	
ⓑ	Work by myself on a different project	.01	--	.01	.01	.10*	--	--	.10*	.05	.01	--	.05

continued

Table 5.10 - Continued

GSCI I would prefer to: Item No.		HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
					Chi-square								
122 a	Be known as a person who is able to do many things, or		1			3			2			4	
ⓑ	Be known as an expert	.10	--	.10	.10	--	--	--	--	--	.10	--	--
172 a	Be thought of as being like everyone else, or		2			4			1			3	
ⓑ	Be thought of as being different	.10	--	--	.10	.05*	--	--	.05*	.10	--	--	.10
182 a	Receive an "A" on a test in which I missed several questions, or		1			2			3			4	
ⓑ	Receive an "A" on a test and only miss one of the questions	--	--	.01	--	--	.05	--	--	.10	.01	.05	.10
188 a	Do something like everyone else does, or		1			2			2			4	
ⓑ	Do something which is different	--	--	.05	--	--	--	--	--	--	.05	--	--
PJCS I would prefer: Item No.		PJCS = Preferred Job Characteristic Scale											
4 ⓐ	A job where I solve problems no one else can		1			2			4			3	
b	A job which permits me to take days off when I want	--	.05	--	--	--	--	.05	--	--	--	--	--
12 ⓐ	A job where I solve problems no one else can		1			3			2			4	
b	A job which does not require a college education	.01	.01	.01	.01	--	.10	.01	--	.05	.01	.10	.05

continued

Table 5.10 - Continued

PJCS Item No.	I would prefer:	HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
		Chi-square											
20 ⓐ	A job where I solve problems no one else can		1			2			4			3	
b	A job which pays well and requires little effort	--	--	--	--	--	--	--	--	--	--	--	--
28 a	A job which requires little thinking		1			2			3			4	
ⓑ	A job where I solve problems no one else can	.05	.05	.05	.05	--	--	.05	--	--	.05	--	--
36 a	A job where I make few if any decisions		1			3			2			4	
ⓑ	A job where I solve problems no one else can	.05	.05	.01	.05	--	.05	.05	--	.05	.01	.05	.05
44 a	A job with short working hours		1			3			2			4	
ⓑ	A job where I solve problems no one else can	--	--	.05	--	--	--	--	--	--	.05	--	--
52 a	A job which does not tie me down		1			3			2			4	
ⓑ	A job where I solve problems no one else can	--	--	.05	--	--	--	--	--	.10	.05	--	.10
60 a	A job where I could not be fired		1			2			3			4	
ⓑ	A job where I solve problems no one else can	.10	.10	.01	.10	--	--	.10	--	--	.01	--	--

Item Analysis

Of the sixteen items fourteen discriminated between at least two of the criterion groups at the .10 level or better.

Reliability

Table 5.11. Summary of Hoyt's Reliability Estimates on Characteristic Scale Four for Each Criterion Group

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
N = Number of Students in Group

Group	N	No. Items	Reliability Estimates
HO	35	16	.75
LO	35	16	.79
HU	35	16	.67
LU	35	16	.66

The reliability estimates ranged from .66 to .79.

Test of Means

The null hypothesis for characteristic analysis is:

There will be no difference between the mean scores of the populations from which each of the four criterion groups are drawn on characteristic scale four.

Symbolically stated, the alternative hypotheses for characteristic analysis are:

$$\overline{HO} > \overline{LO} \qquad \overline{HO} > \overline{HU} \qquad \overline{HO} > \overline{LU}$$
$$\overline{LO} > \overline{HU} \qquad \overline{LO} > \overline{LU} \qquad \overline{HU} > \overline{LU}$$

A summary of the tests of means for characteristic four is presented in Table 5.12.

Table 5.12. Summary of Duncan's Multiple Range Tests for Characteristic Scale Five

Legend:	HO = High Over Achievers LO = Low Over Achievers			HU = High Under Achievers LU = Low Under Achievers		
		LU	LO	HU	HO	Shortest Significant Range
	Means	8.34	9.57	10.48	12.57	(.05 level)
LU	8.34	--	1.23	2.14	4.23	1.52
LO	9.57	--	--	.91	3.00	1.60
HU	10.48	--	--	--	2.09	1.65
		LU	LO	HU	HO	

Of the six comparisons made four were significant at the .05 level.

Characteristic V--School Values and Norms

Characteristic five is concerned with the student's perception of values and norms associated with education and school. Items from the H. T. I. present a statement describing either a positive or negative perception of self relative to a school value or norm. Choice of response is based on frequency of this perception by the student. Items from the G. S. C. I. present statements in pairs, one of which is a school related value and the other a non school related value or a lesser school value. Prediction of choice of response to these statements is based on the rationale presented on page 43 chapter three.

Item Analysis

The null hypothesis for item analysis is:

There will be no difference in the response frequency of the populations from which each of the four criterion groups of students are drawn for each of the items on characteristic scale five.

The alternative hypotheses stated symbolically relative to response frequency for each item are:

fHO > fLO	fHO > fHU	fHO > fLU
fLO > fHU	fLO > fLU	fHU > fLU

A summary of the item analysis for characteristic scale five is presented in Table 5.13.

Table 5.13. Summary of Chi-square Analysis of Items--Academic Achievement Characteristic Scale Five

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
Numbers 1, 2, 3, 4 refer to rank order of group response frequency to item scored in direction indicated.
One is highest frequency, four is lowest frequency.
Items scored in direction of circled alternative or response number indicated.
* Items reversed predicted direction of difference. HTI = Human Trait Inventory.

HTI Item No.	Ratings: 1 Never 2 Sometimes 3 Usually 4 Always	Chi-squares											
		HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
3	I worry about my grades (3, 4)	--	2 .10	--	--	1 .05	--	.10	4 .05	--	--	3 --	--
29	It is difficult for me to keep interest in most of my school subjects (1, 2)	.01	1 .05	.01	.01	3 --	--	.05	2 --	--	.01	4 --	--
52	Most of my school subjects are a complete waste of time (1, 2)	--	2 --	.10	--	1 --	.05	--	3 --	--	.10	4 .05	--
53	Most of my school subjects are useful (3, 4)	--	1 .05	.01	--	1 .05	.01	.05	3 .05	--	.01	4 .01	--
54	I find it difficult to find the time to study my assignments for the next day (1, 2)	--	1 .10	.01	--	2 --	.05	.10	3 --	--	.01	4 .05	--
66	I have a hard time concentrating on the subject during class periods (1, 2)	--	1 --	.01	--	2 --	.05	--	3 --	.10	.01	4 .05	.10
68	Even when I do sit down to study I find that my mind tends to wander (1, 2)	--	1 .10	.01	--	2 --	.05	.10	3 --	--	.01	4 .05	--

continued

Table 5.13 - Continued

HTI Item No.	Ratings: 1 Never 2 Sometimes 3 Usually 4 Always	Chi-squares											
		HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
69	I have to be in the mood before I can study (1, 2)	--	.05	--	--	--	--	.05	--	--	--	--	--
73	A college education is unimportant to me (1, 2)	.05	--	--	.05	--	--	--	--	--	--	--	--
74	I like to study (3, 4)	.10	--	.01	.10	--	--	--	--	--	.01	--	--
75	I like to plan very carefully what courses I will take in school (3, 4)	.01	.01	.01	.01	--	--	.01	--	--	.01	--	--
79	I have played hookey from school (1, 2)	--	--	.05	--	--	--	--	--	--	.05	--	--
82	I learn slowly (1, 2)	.01	--	.01	.01	.01*	--	--	.01*	.01	.01	--	.01
87	I have been sent to the principal for misbehaving in class (1, 2)	.10	--	.05	.10	--	--	--	--	--	.05	--	--
90	I think I would like the work of a teacher (3, 4)	--	--	--	--	--	--	--	--	--	--	--	--
101	I have trouble waiting for a class to be over (1, 2)	--	.10	.05	--	--	--	.10	--	--	.05	--	--
106	Society owes a lot more to the business man and the manufacturer than it does to the artist and professor (1, 2)	--	.05	--	--	.10	--	.05	.10	.10	--	--	.10
121	I think teachers are wrong many times and won't admit it (1, 2)	--	--	--	--	--	--	--	--	--	--	--	--

Table 5.13 - Continued

GSCI = Generalized Situational Choice Inventory

GSCI Item No. — I would prefer to:	HO > LO	HO > HU	HO > LU	Chi-squares LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
49 a Receive money for my good grades, or		1			2			3			4	
ⓑ Be allowed to take any course I wanted because of good grades	--	.05	.01	--	--	--	.05	--	--	.01	--	--
59 ⓐ Be allowed to take extra courses before or after school, or		1			2			3			4	
b Just take courses offered during the school day	.10	.10	.01	.10	--	--	.10	--	--	.01	--	--

Item Analysis

Of the twenty items eighteen discriminated between at least two of the criterion groups at the .10 level or better.

Reliability

Table 5.14. Summary of Hoyt's Reliability Estimates on Characteristic Scale Five for Each Criterion Group

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
N = Number of Students in Group

Group	N	No. Items	Reliability Estimate
HO	35	20	.73
LO	35	20	.81
HU	35	20	.56
LU	35	20	.72

The reliability estimates ranged from .56 to .81

Test of Means

The null hypothesis for characteristic analysis is:

There will be no difference between the mean scores of the populations from which each of the four criterion groups are drawn on characteristic scale five.

Symbolically stated, the alternative hypotheses for characteristic analysis are:

$\overline{HO} > \overline{LO}$ $\quad \overline{HO} > \overline{HU}$ $\quad \overline{HO} > \overline{LU}$
$\overline{LO} > \overline{HU}$ $\quad \overline{LO} > \overline{LU}$ $\quad \overline{HU} > \overline{LU}$

A summary of the tests of means for characteristic five is presented in Table 5.15.

Table 5.15. Summary of Duncan's Multiple Range Tests for Characteristic Scale Five

Legend:	HO = High Over Achievers LO = Low Over Achievers		HU = High Under Achievers LU = Low Under Achievers		
		LU	HU	LO	HO	Shortest Significant Range
	Means	11.91	13.29	14.06	16.14	(.05 level)
LU	11.91	--	1.38	2.15	4.23	1.60
HU	13.29	--	--	.77	2.85	1.69
LO	14.06	--	--	--	2.08	1.75
		LU	HU	LO	HO	

Of the six comparisons made four were significant at the .05 level.

Characteristic VI--Student Related Activities

Characteristic six is concerned with the student's perception of activities related and non related to education. Items present a statement of a perception of an activity that is related to education and valuable educationally or a statement of an activity quite unrelated to education or having low educational value. Choice of response is based on frequency of the stated perception by the student. Prediction of choice of response to these statements is based on the rationale presented on page 44 chapter three.

Item Analysis

The null hypothesis for item analysis is:

There will be no difference in the response frequency of the populations from which each of the four criterion groups of students are drawn for each of the items on characteristic scale six.

The alternative hypotheses stated symbolically relative to response frequency for each item are:

fHO > fLO	fHO > fHU	fHO > fLU
fLO > fHU	fLO > fLU	fHU > fLU

A summary of the item analysis for characteristic scale six is presented in Table 5.16.

Table 5.16. Summary of Chi-square Analysis of Items--Academic Achievement Characteristic Scale Six

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
Numbers 1, 2, 3, 4 refer to rank order of group response frequency to item scored in direction indicated.
One is highest frequency, four is lowest frequency.
Items scored in direction of circled alternative or response number indicated.
* Items reversed predicted direction of difference. HTI = Human Trait Inventory

HTI Item No.	Ratings: 1 Never 2 Sometimes 3 Usually 4 Always	Chi-squares HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
2	I like collecting flowers or growing house plants (3, 4)	--	1 --	--	--	1 --	--	--	1 --	--	--	2 --	--
19	I like to collect things such as stamps, flowers, coins, house plants, etc. (3, 4)	.10	1 .01	--	.10	3 --	--	.01	4 --	.05*	--	2 --	.05*
33	I like to read about science (3, 4)	.01	1 --	.05	.01	4 --	--	--	2 --	--	.05	3 --	--
42	I enjoy reading the editorials in the newspaper (3, 4)	.10	1 --	.05	.10	3 --	--	--	2 --	--	.05	4 --	--
48	I can read a long time without tiring my eyes (3, 4)	.05	2 --	--	.05	4 .01*	--	--	1 .01*	.05	--	3 --	.05
78	I like to read about history (3, 4)	--	1 --	.05	--	3 --	--	--	2 --	.05	.05	4 --	.05
92	I would rather be physically active than sit and read (1, 2)	.05	1 --	--	--	4 .05*	--	.05	2 .05*	--	--	3 --	--
123	I like to go to the movies more than once a week (1, 2)	--	2 --	.10	--	1 --	.05	--	3 --	--	.10	4 .05	--
124	I would like to belong to a motorcycle club (1, 2)	--	1 .05	.01	--	2 --	--	.05	3 --	--	.01	4 --	--

Item Analysis

Of the nine items eight discriminated between at least two of the criterion groups at the .10 level or better.

Reliability

Table 5.17. Summary of Hoyt's Reliability Estimates on Characteristic Scale Six for Each Criterion Group

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
N = Number of Students in Group

Group	N	No. Items	Reliability Estimate
HO	35	9	.30
LO	35	9	.18
HU	35	9	-.12
LU	35	9	-.12

The reliability estimates ranged from -.12 to +.30.

Tests of Means

The null hypothesis for characteristic analysis is:

There will be no difference between the mean scores of the populations from which each of the four criterion groups are drawn on characteristic scale six.

Symbolically stated, the alternative hypotheses for characteristic analysis are:

$$\overline{HO} > \overline{LO} \qquad \overline{HO} > \overline{HU} \qquad \overline{HO} > \overline{LU}$$
$$\overline{LO} > \overline{HU} \qquad \overline{LO} > \overline{LU} \qquad \overline{HU} > \overline{LU}$$

A summary of the tests of means for characteristic six is presented in Table 5.18.

Table 5.18. Summary of Duncan's Multiple Range Tests for Characteristic Scale Six

Legend:	HO = High Over Achievers		HU = High Under Achievers		
	LO = Low Over Achievers		LU = Low Under Achievers		
		LU	LO	HU	HO	Shortest Significant Range
	Means	4.43	4.80	5.60	5.71	(.05 level)
LU	4.43	--	.37	1.17	1.28	.60
LO	4.80	--	--	.80	.91	.63
HU	5.60	--	--	--	.11	.66
		LU	LO	HU	HO	

Of the six comparisons made four were significant at the .05 level.

Characteristic VII--Educational Activities

Characteristic seven is concerned with the student's perception of activities and achievements specifically related to education. Each item presents one alternative related to education paired with an alternative not related to education. Prediction of direction of choice between these pairs of alternatives is based on the rationale presented on page 44 chapter three.

Item Analysis

The null hypothesis for item analysis is:

There will be no difference in the response frequency of the populations from which each of the four criterion groups of students are drawn for each of the items on characteristic scale seven.

The alternative hypotheses stated symbolically relative to response frequency for each item are:

fHO ≥ fLO	fHO > fHU	fHO > fLU
fLO > fHU	fLO > fLU	fHU > fLU

A summary of the item analysis for characteristic scale seven is presented in Table 5.19.

Table 5.19. Summary of Chi-square Analysis of Items--Academic Achievement Characteristic Scale Seven

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
Numbers 1, 2, 3, 4 refer to rank order of group response frequency to item scored in direction indicated.
One is highest frequency, four is lowest frequency.
Items scored in direction of circled alternative or response number indicated.
* Items reversed predicted direction of difference. GSCI = Generalized Situational Choice Inventory.

GSCI Item No.	I would prefer to:	Chi-squares HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
3 a	Use my free time to watch television		1			4			2			3	
ⓑ	Give up my free time to learn something	.01	--	.10	.01	.05*	--	--	.05*	--	.10	--	--
29 ⓐ	Have the best teachers in the state in my school, or		1			3			2			4	
b	Have a large recreation center in my school	.01	.01	.01	.01	--	--	.01	--	--	.01	--	--
33 a	Buy a car, or		1			3			2			4	
ⓑ	Continue my education	.01	--	.01	.01	.01*	--	--	.01*	.01	.01	--	.01
34 a	Go to an amusement park, or		1			2			4			3	
ⓑ	Buy a book	--	--	--	--	--	--	--	--	--	--	--	--
81 a	Have a great deal of money, or		2			1			3			3	
ⓑ	Be an expert in my favorite school subject	--	--	--	--	.10	.10	--	.10	--	--	.10	--
104 ⓐ	Study my assignments during study hall, or		1			2			4			3	
b	Wait to study until the mood strikes me	--	.01	.10	--	.05	--	.01	.05	--	.10	--	--

continued

Table 5.19 - Continued

Table 5.19 - Continued

GSCI Item No. — I would prefer to:	Chi-squares											
	HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
108 a Win an argument with my friends, or b Win a school sponsored debate contest	--	1 --	--	--	3 --	--	--	2 --	--	--	4 --	--
109 a See my name as author of the Book-of-the-Month, or b Score the points that win the game for my team	.01	1 --	.01	.01	3 --	--	--	2 --	--	.01	3 --	--
110 a Think of an idea that nobody has ever thought of, or b Set a world's speed record	.01	1 .01	.01	.01	2 .10	--	.01	4 .10	--	.01	3 --	--
111 a Perform well in class, or b Watch television	--	1 .05	.05	--	4 --	--	.05	2 --	--	.05	3 --	--
125 a Work overtime to make more money, or b Get more schooling to make more money	.10	1 .05	.01	.10	2 --	.01	.05	3 --	.01	.01	4 .01	.01
147 a Study, or b Do things with my friends	--	1 --	--	--	2 --	--	--	4 --	--	--	3 --	--
151 a Do my homework, or b Watch my favorite television program	--	2 --	--	--	1 .10	--	--	4 .10	--	--	3 --	--

continued

Table 5.19 - Continued

Table 5.19 - Continued

GSCI I would prefer to: Item No.	Chi-squares HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
154 ⓐ Develop a new and better way to study, or		2			1			4			2	
b Make many new and close friends	--	--	--	--	.10	--	--	.10	--	--	--	--
178 a Put together a new object, or		1			2			3			4	
ⓑ Develop new ideas	.05	.05	.01	.05	--	--	.05	--	--	.01	--	--
183 ⓐ Study for an exam one night and know that I would receive an "A," or		1			2			3			4	
b Go to a party on this night and take a chance on a lower grade	--	--	.01	--	--	.10	--	--	.10	.01	.10	.10
191 ⓐ Buy a set of encyclopedias for my children, or		1			3			2			4	
b Buy a bicycle for my children	.05	.10	.01	.05	--	--	.10	--	--	.01	--	--
193 a Have one of my children win a beauty contest, or		1			1			4			3	
ⓑ Have one of my children win a college scholarship	--	.05	--	--	.05	--	.05	.05	--	--	--	--

Item Analysis

Of the eighteen items fifteen discriminated between at least two of the criterion groups at the .10 level or better.

Reliability

Table 5.20. Summary of Hoyt's Reliability Estimates on Characteristic Scale Seven for Each Criterion Group

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
N = Number of Students in Group

Group	N	No. Items	Reliability Estimates
HO	35	18	.73
LO	35	18	.66
HU	35	18	.72
LU	35	18	.53

The reliability estimates ranged from .53 to .73.

Tests of Means

The null hypothesis for characteristic analysis is:

There will be no difference between the mean scores of the populations from which each of the four criterion groups are drawn on characteristic scale seven.

Symbolically stated, the alternative hypotheses for characteristic analysis are:

$$\overline{HO} > \overline{LO} \qquad \overline{HO} > \overline{HU} \qquad \overline{HO} > \overline{LU}$$
$$\overline{LO} > \overline{HU} \qquad \overline{LO} > \overline{LU} \qquad \overline{HU} > \overline{LU}$$

A summary of the tests of means for characteristic seven is presented in Table 5.21.

Table 5.21. Summary of Duncan's Multiple Range Tests for Characteristic Scale Seven

Legend:	HO = High Over Achievers LO = Low Over Achievers		HU = High Under Achievers LU = Low Under Achievers		
		LU	HU	LO	HO	Shortest Significant Range
	Means	8.66	9.74	10.37	12.91	(.05 level)
LU	8.66	--	1.08	1.71	4.25	1.55
HU	9.74	--	--	.63	3.17	1.63
LO	10.37	--	--	--	2.54	1.68
		LU	HU	LO	HO	

Of the six comparisons made four were significant at the .05 level.

Characteristic VIII--Perception of Teacher's Image--Enhancement

Characteristic eight is concerned with the student's perception of what teachers feel about him. All of the items contain descriptive words highly valued relative to the student role. Choice of response is dependent upon the frequency with which the student perceives that teachers feel about him in the described manner. Prediction of direction of choice of response to these statements is based on the rationale presented on pages 44 and 45 chapter three.

Item Analysis

The null hypothesis for item analysis is:

There will be no difference in the response frequency of the populations from which each of the four criterion groups of students are drawn to each of the items on characteristic scale eight.

The alternative hypotheses stated symbolically relative to response frequency for each item are:

fHO > fLO	fHO > fHU	fHO > fLU
fLO > fHU	fLO > fLU	fHU > fLU

A summary of the item analysis for characteristic scale eight is presented in Table 5.22.

Table 5.22. Summary of Chi-square Analysis of Items--Academic Achievement Characteristic Scale Eight

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
Numbers 1, 2, 3, 4 refer to rank order of group response frequency to item scored in direction indicated. One is highest frequency, four is lowest frequency.
Items scored in direction of circled alternative or response number indicated.
* Items reversed predicted direction of difference WRL = Word Rating List.

WRL Item No.	Teachers feel that I am: 1 Never 2 Sometimes 3 Usually 4 Always	Chi-squares											
		HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
2	Talented (3, 4)	1 .01	1 .01	1 .01	2 .01	2 .05	2 .01	3 .01	3 .05	3 --	4 .01	4 .01	4 --
10	Logical (3, 4)	1 .01	1 .01	1 .01	2 .01	2 --	2 .10	3 .01	3 --	3 --	4 .01	4 .10	4 --
12	Smart (3, 4)	1 .01	1 .01	1 .01	3 .01	3 --	3 --	2 .01	2 --	2 --	4 .01	4 --	4 --
13	Successful (3, 4)	1 .01	1 .01	1 .01	2 .01	2 --	2 --	3 .01	3 --	3 --	4 .01	4 --	4 --
22	Studious (3, 4)	1 .01	1 .01	1 .01	2 .01	2 --	2 .05	3 .01	3 --	3 --	4 .01	4 .05	4 --
29	Responsible (3, 4)	1 .01	1 .01	1 .01	2 .01	2 --	2 --	2 .01	2 --	2 --	4 .01	4 --	4 --
34	Intelligent (3, 4)	1 .01	1 .01	1 .01	3 .01	3 --	3 --	2 .01	2 --	2 .10	4 .01	4 --	4 .10
36	In-the know (3, 4)	1 .01	1 .05	1 .01	3 .01	3 --	3 --	2 .05	2 --	2 --	4 .01	4 --	4 --

continued

Table 5.22 - Continued

WRL Item No.	Teachers feel that I am: 1 Never 2 Sometimes 3 Usually 4 Always	Chi-squares											
		HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
47	"Sharp" (3, 4)	1 .01	.01	.01	2 .01	--	--	4 .01	--	--	3 .01	--	--
48	Dependable (3, 4)	1 .05	.01	.01	2 .05	--	--	3 .01	--	--	4 .01	--	--
49	Shrewd (3, 4)	1 .01	--	.01	3 .01	--	--	2 --	--	--	3 .01	--	--
71	Alert (3, 4)	1 .01	.05	.01	3 .01	--	--	2 .05	--	.05	4 .01	--	.05
76	Above Average (3, 4)	1 .01	.01	.01	2 .01	--	--	2 .01	--	--	4 .01	--	--
77	Productive (3, 4)	1 .01	.01	.01	2 .01	--	--	3 .01	--	--	4 .01	--	--
82	Motivated (3, 4)	1 .01	.01	.01	2 .01	.05	--	4 .01	.05	--	3 .01	--	--
83	A Thinker (3, 4)	1 .01	.01	.01	2 .01	--	--	3 .01	--	--	3 .01	--	--
85	Ambitious (3, 4)	1 .10	.01	.01	2 .10	.05	.10	4 .01	.05	--	3 .01	.10	--
97	An Achiever (3, 4)	1 .01	.01	.01	3 .01	--	--	2 .01	--	--	4 .01	--	--

continued

Table 5.22 - Continued

WRL Item No.	Teachers feel that I am: 1 Never 2 Sometimes 3 Usually 4 Always	Chi-squares											
		HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
98	A Planner (3, 4)	1 .01	1 .01	1 .01	2 .01	2 --	2 --	2 .01	2 --	2 --	4 .01	4 --	4 --
101	Competent (3, 4)	1 .01	1 .01	1 .01	3 .01	3 --	3 --	2 .01	2 --	2 --	4 .01	4 --	4 --
103	Teachable (3, 4)	1 .01	1 .01	1 .01	4 .01	4 .05*	4 --	2 .01	2 .05*	2 --	3 .01	3 --	3 --
105	Inquisitive (3, 4)	1 .01	1 .05	1 .01	4 .01	4 --	4 --	2 .05	2 --	2 --	3 .01	3 --	3 --
115	Efficient (3, 4)	1 .01	1 .01	1 .01	2 .01	2 --	2 --	3 .01	3 --	3 --	4 .01	4 --	4 --
118	Reliable (3, 4)	1 .01	1 .05	1 .01	3 .01	3 --	3 --	2 .05	2 --	2 .05	4 .01	4 --	4 .05
119	Serious (3, 4)	1 .01	1 .05	1 .01	3 .01	3 --	3 --	2 .05	2 --	2 --	4 .01	4 --	4 --

Item Analysis

Of the twenty five items all discriminated between at least two of the criterion groups at the .10 level or better.

Reliability

Table 5.23. Summary of Hoyt's Reliability Estimates on Characteristic Scale Eight for Each Criterion Group

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
N = Number of Students in Group

Group	N	No. Items	Reliability Estimate
HO	35	25	.95
LO	35	25	.96
HU	35	25	.93
LU	35	25	.87

The reliability estimates ranged from .87 to .96.

Tests of Means

The null hypothesis for characteristic analysis is:

There will be no difference between the mean scores of the populations from which each of the four criterion groups are drawn on characteristic scale eight.

Symbolically stated, the alternative hypotheses for characteristic analysis are:

$\overline{HO} > \overline{LO}$ $\overline{HO} > \overline{HU}$ $\overline{HO} > \overline{LU}$
$\overline{LO} > \overline{HU}$ $\overline{LO} > \overline{LU}$ $\overline{HU} > \overline{LU}$

A summary of the tests of means for characteristic eight is presented in Table 5.24.

Table 5.24. Summary of One Tailed t Tests for Mean Difference Between Criterion Groups on Characteristic Scale Eight

Legend: HO = High Over Achievers	HU = High Under Achievers	
LO = Low Over Achievers	LU = Low Under Achievers	
Means Compared	t Value	Significant at .05 Level
HO > LO	8.16	Yes
HO > HU	8.29	Yes
HO > LU	11.15	Yes
LO > HU	.15	No
LO > LU	1.78	Yes
HU > LU	1.60	No

Of the six comparisons made four were significant at the .05 level.

Characteristic IX--Perception of Teacher's Image--Maintenance

Characteristic nine is concerned with the student's perception of what teachers feel about him. All of the items contain descriptive words not highly valued in the student role and assumed to be descriptive of students at or near the maintenance level. Choice of response is dependent upon the frequency with which the student perceives that teachers feel about him in the described manner. Prediction of choice of response to these statements is based on the rationale presented on pages 44 and 45 chapter three.

Item Analysis

The null hypothesis for item analysis is:

There will be no difference in the response frequency of the populations from which each of the four criterion groups of students are drawn to each of the items on characteristic scale nine.

The alternative hypotheses stated symbolically relative to response frequency for each item are:

fHO > fLO	fHO > fHU	fHO > fLU
fLO > fHU	fLO > fLU	fHU > fLU

A summary of the item analysis for characteristic scale nine is presented in Table 5.25.

Table 5.25. Summary of Chi-square Analysis of Items--Academic Achievement Characteristic Scale Nine

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
Numbers 1, 2, 3, 4 refer to rank order of group response frequency to item scored in direction indicated.
One is highest frequency, four is lowest frequency.
Items scored in direction of circled alternative or response number indicated.
* Items reversed predicted direction of difference. WRL = Word Rating List.

WRL Item No.	Teachers feel that I am: 1 Never 2 Sometimes 3 Usually 4 Always	Chi-squares											
		HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
3	Dull (1, 2)		1			2			3			4	
		--	.05	.05	--	--	--	.05	--	--	.05	--	--
4	Inefficient (1, 2)		1			1			3			4	
		--	.05	.01	--	.05	.01	.05	.05	--	.01	.01	--
9	Average (1, 2)		1			4			3			2	
		.01	.01	.01	.01	--	.10*	.01	--	--	.01	.10*	--
11	Unsuccessful (1, 2)		1			3			1			4	
		--	--	.05	--	--	--	--	--	.05	.05	--	.05
14	"Blah" (1, 2)		1			4			3			2	
		.01	.01	.05	.01	--	.05*	.01	--	--	.05	.05*	--
20	A Procrastinator (1, 2)		1			4			3			2	
		.05	.05	--	.05	--	--	.05	--	--	--	--	--
21	Unreliable (1, 2)		1			2			2			4	
		.05	.05	.05	.05	--	--	.05	--	--	.05	--	--
35	Distractable (1, 2)		1			2			4			3	
		--	.01	.05	--	--	--	.01	--	--	.05	--	--

continued

Table 5.25 - Continued

WRL Item No.	Teachers feel that I am: 1 Never 2 Sometimes 3 Usually 4 Always	Chi-squares											
		HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
44	Below Average (1, 2)	.10	1 --	.01	.10	3 --	--	--	2 --	.10	.01	4 --	.10
51	A Good Off (1, 2)	--	1 .05	--	--	1 .05	--	.05	4 .05	--	--	3 --	--
53	Lazy (1, 2)	--	1 .05	.05	--	2 --	--	.05	3 --	--	.05	3 --	--
92	A Person Who Delays (1, 2)	--	1 --	.10	--	3 --	--	--	2 --	--	.10	4 --	--
94	Irresponsible (1, 2)	.10	1 --	.05	.10	3 --	--	--	2 --	--	.05	4 --	--
100	Indifferent (1, 2)	--	1 .01	.05	--	2 .10	--	.01	4 .10	--	.05	3 --	--
111	Inaccurate (1, 2)	.10	1 .05	.05	.10	2 --	--	.05	3 --	--	.05	3 --	--
117	Easily Distracted (1, 2)	.01	1 .01	.01	.01	2 --	--	.01	4 --	--	.01	3 --	--

Item Analysis

Of the sixteen items all discriminated between at least two of the criterion groups at the .10 level or better.

Reliability

Table 5.26. Summary of Hoyt's Reliability Estimates on Characteristic Scale Nine for Each Criterion Group

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
N = Number of Students in Group

Group	N	No. Items	Reliability Estimate
HO	35	16	.90
LO	35	16	.78
HU	35	16	.69
LU	35	16	.75

The reliability estimates ranged from .69 to .90.

Tests of Means

The null hypothesis for characteristic analysis is:

There will be no difference between the mean scores of the populations from which each of the four criterion groups are drawn on characteristic scale nine.

Symbolically stated, the alternative hypotheses for characteristic analysis are:

$$\overline{HO} > \overline{LO} \qquad \overline{HO} > \overline{HU} \qquad \overline{HO} > \overline{LU}$$
$$\overline{LO} > \overline{HU} \qquad \overline{LO} > \overline{LU} \qquad \overline{HU} > \overline{LU}$$

A summary of the tests of means for characteristic nine is presented in Table 5.27.

Table 5.27. Summary of One Tailed t Tests for Mean Difference Between Criterion Groups on Characteristic Scale Nine

Legend:	HO = High Over Achievers LO = Low Over Achievers	HU = High Under Achievers LU = Low Under Achievers
Means Compared	t Value	Significant at .05 Level
HO > LO	4.84	Yes
HO > HU	5.80	Yes
HO > LU	7.04	Yes
LO > HU	.47	No
LO > LU	1.49	No
HU > LU	1.08	No

Of the six comparisons made three were significant at the .05 level.

Characteristic X--Perception of Teacher's Image--Uniqueness

Characteristic ten is concerned with the student's perception of what teachers feel about him. All of the items contain descriptive words assumed to be descriptive of students at a high or unique enhancement level. Choice of response is dependent upon the frequency with which the student perceives that teachers feel about him in the described manner. Prediction of choice of response to these statements is based on the rationale presented on pages 44 and 45 chapter three.

Item Analysis

The null hypothesis for item analysis is:

There will be no difference in the response frequency of the populations from which each of the four criterion groups of students are drawn to each of the items on characteristic scale ten.

The alternative hypotheses stated symbolically relative to response frequency for each item are:

fHO > fLO	fHO > fHU	fHO > fLU
fLO > fHU	fLO > fLU	fHU > fLU

A summary of the item analysis for characteristic scale ten is presented in Table 5.28.

Table 5.28. Summary of Chi-square Analysis of Items--Academic Achievement Characteristic Scale Ten

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
Numbers 1, 2, 3, 4 refer to rank order of group response frequency to item scored in direction indicated. One is highest frequency, four is lowest frequency.
Items scored in direction of circled alternative or response number indicated.
* Items reversed predicted direction of difference. WRL = Word Rating List.

WRL Item No.	Teachers feel that I am: 1 Never 2 Sometimes 3 Usually 4 Always	Chi-squares											
		HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < HU	HU > LU	LU < HO	LU < LO	LU < HU
7	Curious (3, 4)		2			1			4			3	
		--	--	--	--	--	--	--	--	--	--	--	--
23	Different (3, 4)		3			4			1			2	
		--	--	--	--	.10*	--	--	.10*	--	--	--	--
30	Creative (3, 4)		1			2			4			3	
		.05	.01	.01	.05	.10	--	.01	.10	--	.01	--	--
32	Original (3, 4)		1			2			3			4	
		--	--	.05	--	--	.05	--	--	--	.05	.05	--
55	Perfectionistic (3, 4)		1			3			2			4	
		.01	.05	.01	.01	--	--	.05	--	--	.01	--	--
67	Intellectual (3, 4)		1			3			2			3	
		.01	.01	.01	.01	--	--	.01	--	--	.01	--	--
73	Brilliant (3, 4)		1			2			4			2	
		.01	.01	.01	.01	--	--	.01	--	--	.01	--	--
79	A "brain" (3, 4)		1			4			2			2	
		.01	.01	.01	.01	--	--	.01	--	--	.01	--	--
86	Unusual (3, 4)		2			2			2			1	
		--	--	--	--	--	--	--	--	--	--	--	--
87	Independent (3, 4)		1			3			1			4	
		--	--	.05	--	--	--	--	--	.05	.05	--	.05

Item Analysis

Of the ten items eight discriminated between at least two of the criterion groups at the .10 level or better.

Reliability

Table 5.29. Summary of Hoyt's Reliability Estimates on Characteristic Scale Ten for Each Criterion Group

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
N = Number of Students in Group

Group	N	No Items	Reliability Estimate
HO	35	10	.81
LO	35	10	.65
HU	35	10	.40
LU	35	10	.62

The reliability estimates ranged from .40 to .81.

Tests of Means

The null hypothesis for characteristic analysis stated directionally is:

> There will be no difference between the mean scores of the populations from which each of the four criterion groups are drawn on characteristic scale ten.

Symbolically stated, the alternative hypotheses for characteristic analysis are:

$\overline{HO} > \overline{LO}$ $\quad \overline{HO} > \overline{HU}$ $\quad \overline{HO} > \overline{LU}$
$\overline{LO} > \overline{HU}$ $\quad \overline{LO} > \overline{LU}$ $\quad \overline{HU} > \overline{LU}$

A summary of the tests of means for characteristic ten is presented in Table 5.30.

Table 5.30. Summary of Duncan's Multiple Range Tests for Characteristic Scale Ten

Legend:	HO = High Over Achievers		HU = High Under Achievers		
	LO = Low Over Achievers		LU = Low Under Achievers		
		LU	LO	HU	HO	Shortest Significant Range
	Means	2.91	3.09	3.11	5.26	(.05 level)
LU	2.91	--	.18	.20	2.35	1.09
LO	3.09	--	--	.02	2.17	1.15
HU	3.11	--	--	--	2.15	1.19
		LU	LO	HU	HO	

Of the six comparisons made three were significant at the .05 level.

Characteristic XI--Significant Others

Characteristic eleven is concerned with the student's perception of significant others relative to educationally oriented alternatives. Each item presents one alternative indicative of the fact that the student places high value on education and values, goals or norms related to education. In each item this alternative is paired with an alternative more relevant to an area of endeavor other than education. Prediction of direction of choice between these pairs of alternatives is based on the rationale presented on page 45 chapter three.

Item Analysis

The null hypothesis for item analysis is:

There will be no difference between the responses of the populations from which each of the four criterion groups of students are drawn for each of the items on characteristic scale eleven.

The alternative hypotheses stated symbolically relative to response frequency for each item are:

fHO $\geq$ fLO	fHO > fHU	fHO > fLU
fLO > fHU	fLO > fLU	fHU > fLU

A summary of the item analysis for characteristic scale eleven is presented in Table 5.31.

Table 5.31. Summary of Chi-square Analysis of Items--Academic Achievement Characteristic Scale Eleven

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
Numbers 1, 2, 3, 4 refer to rank order of group response frequency to item scored in direction indicated.
One is highest frequency, four is lowest frequency.
Items scored in direction of circled alternative or response number indicated.
* Items reversed predicted direction of difference. GSCI = Generalized Situational Choice Inventory.

GSCI I would prefer to: Item No.	Chi-squares HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
7 a Be praised at home, or		1			2			4			2	
ⓑ Be praised at school	.05	.01	.05	.05	--	--	.01	--	--	.05	--	--
14 ⓐ Be graded on how much the teacher thinks I have learned, or		1			3			4			2	
b Be graded on how much I think I have learned	--	--	--	--	--	--	--	--	--	--	--	--
21 ⓐ Receive a grade on the basis of how well I did on a teacher's test, or		1			2			4			3	
b Get a grade on the basis of how hard I tried	.01	.01	.01	.01	--	--	.01	--	--	.01	--	--
25 a Be graded compared to the rest of the class, or		1			2			4			3	
ⓑ Be graded compared to a standard held by the teacher	.10	.01	.05	.10	--	--	.01	--	--	.05	--	--
48 a Have friends that are a lot of fun, or		1			2			4			2	
ⓑ Have friends that I learn something from	--	--	--	--	--	--	--	--	--	--	--	--

continued

Table 5.31 - Continued

GSCI Item No.	I would prefer to:	Chi-squares HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
57 ⓐ	Be known to my parents as an intelligent person, or		1			2			2			4	
b	Be known to my parents as a practical person	--	--	--	--	--	--	--	--	--	--	--	--
78 ⓐ	Have a better job than my father has, or		1			3			2			4	
b	Have a job like my father has	.05	--	.01	.05	.10*	--	--	.10*	.05	.01	--	.05
100 ⓐ	Have my classmates know how I did on a test, or		1			4			2			3	
b	Be the only person who knows how I did on a test	.10	--	.10	.10	--	--	--	--	--	.10	--	--
120 ⓐ	Receive a grade on the basis of how I did on my teacher's test, or		1			1			4			3	
b	Receive a grade on the basis of how I compared with my classmates	--	--	--	--	--	--	--	--	--	--	--	--
166 ⓐ	Be criticized at home and praised in school, or		1			2			4			3	
b	Be criticized at school and praised at home	--	--	--	--	--	--	--	--	--	--	--	--
185 ⓐ	Choose a friend because I could learn something from him or her, or		3			1			4			2	
b	Choose a friend because I could have fun doing things with him or her	--	--	--	--	.05	--	--	.05	.05	--	--	.05

continued

Table 5.31 - Continued

GSCI I would prefer to: Item No.	Chi-squares											
	HO > LO	HO > HU	HO > LU	LO < HO	LO > HU	LO > LU	HU < HO	HU < LO	HU > LU	LU < HO	LU < LO	LU < HU
187 (a) Date the smartest girl or boy in class, or		2			1			4			2	
b Date the girl or boy who is the most fun	--	--	--	--	--	--	--	--	--	--	--	--

Item Analysis

Of the twelve items six discriminated between at least two of the criterion groups at the .10 level or better.

Reliability

Table 5.32. Summary of Hoyt's Reliability Estimates on Characteristic Scale Eleven for Each Criterion Group

Legend: HO = High Over Achievers HU = High Under Achievers
LO = Low Over Achievers LU = Low Under Achievers
N = Number of Students in Group

Group	N	No Items	Reliability Estimate
HO	35	12	.48
LO	35	12	.35
HU	35	12	-.90
LU	35	12	-.46

The reliability estimates ranged from -.90 to +.48.

Tests of Means

The null hypothesis for characteristic analysis is:

There will be no difference between the mean scores of the populations from which each of the four criterion groups are drawn on characteristic scale eleven.

Symbolically stated, the alternative hypotheses for characteristic analysis are:

$$\overline{HO} > \overline{LO} \qquad \overline{HO} > \overline{HU} \qquad \overline{HO} > \overline{LU}$$
$$\overline{LO} > \overline{HU} \qquad \overline{LO} > \overline{LU} \qquad \overline{HU} > \overline{LU}$$

A summary of the tests of means for characteristic eleven is presented in Table 5.33.

Table 5.33. Summary of Duncan's Multiple Range Tests for Characteristic Scale Eleven

Legend:	HO = High Over Achievers			HU = High Under Achievers	
	LO = Low Over Achievers			LU = Low Under Achievers	
		HU	LU	LO	HO	Shortest Significant Range
	Means	4.48	4.94	5.46	6.71	(.05 level)
HU	4.48	--	.46	.98	2.23	.89
LU	4.94	--	--	.52	1.77	.94
LO	5.46	--	--	--	1.25	.97
		HU	LU	LO	HO	

Of the six comparisons made four were significant at the .05 level.

The Total Instrument

Reliability estimates and a comparison between means of the four criterion groups on the total instrument comprised of all eleven characteristic scales were calculated.

Reliability

The reliability of the total instrument estimated by Hoyt's analysis of variance technique for all students over all items was found to be .95.

Tests of Means

The null hypothesis for analysis of the total instrument is:

There will be no difference between the mean scores of the populations from which each of the four criterion groups are drawn on the total instrument.

Symbolically stated, the alternative hypotheses for analysis of the total instrument are:

$$\overline{\overline{HO}} > \overline{\overline{LO}} \qquad \overline{\overline{HO}} > \overline{\overline{HU}} \qquad \overline{\overline{HO}} > \overline{\overline{LU}}$$

$$\overline{\overline{LO}} > \overline{\overline{HU}} \qquad \overline{\overline{LO}} > \overline{\overline{LU}} \qquad \overline{\overline{HU}} > \overline{\overline{LU}}$$

The variances of the criterion groups on the total instrument were found, by the F max method, to be significantly heterogeneous at the .05 level but not at the .01 level. The decision was made to test the means by t tests rather than by Duncan's method in order to hold to a more conservative protection level by making weighted variance estimates rather than pooling variance when heterogeneity might effect the outcome of the test. Welch's formula for degrees of freedom was used with the t tests.

A summary of the tests of means for the total instrument is presented in Table 5.34.

Table 5.34. Summary of One Tailed t Tests for Mean Differences on Total Instrument

Legend:	HO = High Over Achievers LO = Low Over Achievers	HU = High Under Achievers LU = Low Under Achievers
Means Compared	t Value	Significant at .05 Level
HO > LO	7.90	Yes
HO > HU	8.16	Yes
HO > LU	14.63	Yes
LO > HU	- .31	No
LO > LU	3.10	Yes
HU > LU	3.71	Yes

Of the six comparisons made five were significant at the .05 level.

Summary

The analysis of data was presented in chapter five in twelve sections, one section for each of the eleven characteristic scales and one section for the total instrument. Each of the eleven characteristic sections contained the results of a Chi-square analysis of items, a Hoyt's reliability estimate for each criterion group, and a test of the difference between means of each group against each of the other three groups. In all sixty six comparisons were made of which forty three differences were found to be significant at the .05 level. A short description of each characteristic was given with a reference to the source of its derivation in chapter three. The reliability estimate of the total instrument over all four groups was found to be .95. Results of tests of differences between means of each group against each of the other three groups on the total instrument were presented. Of the six comparisons five were found to be significant at the .05 level.

In the next chapter these results will be discussed.

CHAPTER VI

DISCUSSION OF RESULTS

In this chapter the results for each characteristic scale, for the total instrument, and for the study in general are discussed. The findings, presented in chapter five, are synthesized and interpreted to clarify their theoretical implication for explaining the behavior of the criterion groups of students.

Characteristic One--Importance of Student Image

The fifteen face validated items composing characteristic scale one measure importance of student image for self concept. The rationale assumes that if student image is an important image from which much of self concept is abstracted the student will often and intensely perceive of himself as a student. The items present pairs of cues, one attempts to stimulate the rise of student image to figure and the other attempts to stimulate the rise of another self image to figure. It is assumed that the statement congruent with the image of self in figure will be chosen. Higher level students are assumed to have important student images and thus to frequently choose the student related alternative.

The High Over achievers mean response score was found to be significantly different from the mean of each of the other three criterion groups. No other significant mean differences were found in the six comparisons made.

Of the fifteen items four failed to discriminate. Nine items discriminated the High Over achievers from one or more of the other groups. Two items discriminated in the opposite of theory predicted direction between pairs of groups not containing High Over Achievers.

The reliability estimates of this scale are low, ranging from .25 to .71 for the four groups. Therefore, differences between groups may be due to the theorized differences or to other factors measured by this scale. The fact that four of the fifteen items did not discriminate accounts for part of the unreliability.

Tentatively, with the above caution in mind, the null hypotheses of no differences in importance of student image is rejected for High Over achievers. It will be concluded that the student image of High Over achievers is significantly more important to their self concept than are the student images of either of the other three criterion groups of students for their self concepts.

Characteristic Two--Level of Self Concept

The face validated items composing characteristic scale two measure the level of self concept. It is theorized that if self concept is perceptually organized at a certain level then self needs and perception of reward will be at a similar level. On the basis of face validity, items present cues descriptive of needs or rewards related to self perceptions which are at either the maintenance level or the enhancement level. It is assumed that the student image will be at a level similar to self concept level. On this basis high level students are expected to more often perceive of themselves at the enhancement level and thus to more frequently respond to the enhancement alternative.

The mean of High Over achievers was found to be significantly different from the mean of each of the other three criterion groups.

A significant difference was also found between the mean of Low Under and High Under achievers. No other significant mean differences were found in the six comparisons made.

Of the sixteen items one failed to discriminate. Fifteen items discriminated between High Over achievers and at least one other group. Four items discriminated between Low Under and High Under achievers. Two items discriminated in the opposite of predicted direction between Low Over and High Under achievers.

The reliability estimates of scale two are low, ranging from .25 to .50 for the four groups. The differences between groups reported may be due to the theorized differences or due to other factors measured by this scale. Inspectional examination of the items of scale two suggests a heterogeneous measure of self concept level. These may be: self related to work, self as known by others, self related to future, and level of achievement relative to a "generalized other." If the above were true, this could account for the low reliability estimates.

Tentatively, with the above caution in mind, the null hypothesis of no differences in level of self concept is rejected for High Over achievers, and for Low Under achievers when compared with High Under achievers. It will be concluded that the self concepts of High Over achievers are at a significantly higher level than the self concepts of students in any of the other three groups. Furthermore, the self concept of High Under achievers is significantly higher than that of Low Under achievers.

Characteristic Three--Level of Student Image

The face validated items composing characteristic scale three measure the level of student image. Theoretically if student image is perceptually organized at a specified level then perception of needs and rewards related to student image will be at a similar level. The items

present cues descriptive of two alternatives one of which is at the maintenance level and the other at the enhancement level. High level students are assumed to have perceptually organized their student image at a high level and thus are expected to frequently choose the enhancement alternative.

The mean of each of the four criterion groups was found to be different from the mean of each of the other three criterion groups. High Under achievers' mean was found to be significantly above the mean of Low Over achievers. This was the opposite of prediction.

Of the twenty four items all discriminated between the High Over achievers and at least one other group and between the Low Under achievers and at least one other group. Four items discriminated in the opposite of predicted direction between Low Over and High Under achievers.

The reliability estimates of this scale are of an acceptable magnitude considering the length of the scale. They range from .79 to .91 for the four groups.

The null hypotheses of no differences in level of student image is rejected for all six possible group comparisons. It is concluded that the student image of each of the four criterion groups is organized at a significantly different level than the other three groups. All differences are in the hypothesized direction except that the student image of High Under achievers was found to be significantly above that of Low Over achievers.

Characteristic Four--Level of Uniqueness

The face validated items composing characteristic scale four measure the level of uniqueness in the perceptual organization of self. The rationale is that if a student perceives of himself as unique at the

high end of any continuum he will perceive needs and rewards at this level. The highest level students are assumed to more often organize their self perceptions at a high and unique level. Thus, they are expected to respond to cues at a high level more frequently than other students.

The mean of High Over achievers was found to be significantly different from the mean of each of the other three criterion groups. A significant difference was also found between the means of Low Under and High Under achievers. No other significant mean differences were found.

Of the sixteen items two failed to discriminate. Fourteen discriminated between High Over achievers and at least one other criterion group and thirteen discriminated between Low Under achievers and at least one other criterion group. Four items discriminated in the opposite of predicted direction between Low Over and High Under achievers.

The reliability estimates of this scale are sufficiently low that some caution in interpretation should be used. However, considering the length of the scale, interpretation within the limits of the reliability estimates, which range from .66 to .79 for the four groups, is feasible. The scale may be measuring uniqueness related to two different self referents which may not be homogeneous. The probable heterogeneous self referents may be: self related to an occupation or a task and self related to other persons. If so, this could account for some loss of reliability.

With the above caution in mind the null hypothesis of no difference in unique aspects of self concept is rejected for High Over achievers and for Low Under achievers when compared with High Under achievers. It will be concluded that High Over achievers have organized into their self concepts more elements of uniqueness at a high level than have any

of the other three criterion groups. Also, High Under achievers have more uniqueness at a high level organized into their self concepts than have Low Under achievers.

Characteristic Five--School Values and Norms

The face validated items composing characteristic scale five measure the level of the student's perception of school related values and norms. Theoretically, the high level student is receiving greater value and reward from his interaction within the student role. To receive reward within a role the expectations and values of the role must be met. It is thus assumed that the high level student perceptually organizes more school related values and norms into his student image than the lower level student. On this basis high level students are expected to more often perceive of themselves in a way conforming to the norms of education and rewarding to student image.

The mean of High Over achievers was found to be significantly different from the mean of each of the other three criterion groups. The mean of Low Under achievers was found to differ from the mean of Low Over achievers. No other significant mean differences were found.

Of the twenty items two failed to discriminate. Eighteen items discriminated between High Over achievers and at least one other group while fifteen items discriminated between Low Under achievers and at least one other group. Three items discriminated in the predicted and one in the opposite of predicted direction between Low Over and High Under achievers.

The reliability estimates of scale five are somewhat low, ranging from .56 to .81. Because of this, differences between groups may be due to the theorized differences or due to other factors measured by this scale. This caution is more applicable to High Under achievers than

to the other three groups. The only two items which failed to discriminate dealt with perceptions of values related to teachers. It appears that perception of non teacher related norms and values may be a different factor than perception of values ascribed to teachers.

With the above caution in mind the null hypothesis of no difference in internalization of school related values and norms is rejected for High Over achievers and for Low Under achievers when compared with Low Over achievers. It is concluded that High Over achievers have internalized significantly more school values and norms than have any of the other three groups. Also, Low Over achievers have internalized significantly more school values and norms than have Low Under achievers.

Characteristic Six--Student Related Activities

The face validated items composing characteristic scale six measure the student's perception of himself related to activities either valuable in the student role, unrelated to the student role or possibly opposed to success in the student role. Theoretically the high level student who is successful in the student role more often perceives as rewarding and engages in activities related to success in the student role. Conversely, the lower level student is expected to perceive as valuable and engage in activities not related to success in the student role more frequently.

The mean of High Over achievers was found to be significantly different from the mean of Low Over and Low Under achievers. Low Under achievers' mean was found to be different from High Under achievers. Low Over achievers' mean was found to be different from High Under achievers in the opposite of predicted direction. No other significant mean differences were found.

Of the nine items one failed to discriminate. Eight items discriminated between High Over achievers and at least one other group. Seven discriminated between Low Under achievers and at least one other group. Two items discriminated between Low Over and High Under achievers in the opposite of predicted direction.

The reliability estimates of scale six (-.12 to +.30) are so low that no interpretation of results is possible without great possibility of error and misinterpretation. This may be due partly to the length of the scale--nine items. Upon inspectional examination of the items this scale may be measuring two different aspects of activities. These may be: activities related to education and activities non related to education. Degree of relatedness to education may also be a factor contributing to heterogeneity of items within the scale.

Because, 1) the means arranged themselves in the predicted order of magnitude and, 2) four significantly different paired comparisons resulted, this characteristic may warrant further study but no conclusions are drawn here.

Characteristic Seven--Educational Activities

The face validated items composing characteristic scale seven measure the student's choice of activities related to education when paired with activities not related to education. Theoretically the student whose student image is important to his self concept and whose student image is perceptually organized at a high or enhancement level perceives activities related to maintenance or enhancement of his student image as rewarding. On this basis high level students are expected to more frequently choose the educationally related alternative activity.

The mean of High Over achievers was found to be significantly different from each of the other three criterion groups. The mean of

Low Under achievers was different from the mean of Low Over achievers. No other significant mean differences were found.

Of the eighteen items three failed to discriminate. Twelve items discriminated between High Over achievers and between Low Under achievers and at least one other group. Eight items discriminated between Low Over and High Under achievers, four as predicted and four in the opposite of predicted direction.

The reliability estimates for scale seven are sufficiently low that caution should be used when interpreting results of this scale. They range from .53 to .73 for the four groups. Thus differences reported between groups may be due to hypothesized difference or to other factors measured by the scale. Upon inspectional examination of items this scale may be grouping together activities that are related to education in differing degrees. It may also be that the scale is measuring different types of alternatives to education such as activity alternatives and friendship or affiliation alternatives.

With the above caution in mind the null hypotheses of no differences in choice between activities related and non related to education are rejected for High Over achievers and for Low Under achievers when compared with Low Over achievers. It will be concluded that High Over achievers choose to engage in educationally related activities significantly more often than do any of the other three groups. Also, Low Over achievers engage in educationally related activities significantly more often than do Low Under achievers.

Characteristic Eight--Perception of Teacher's Image--Enhancement

The face validated items composing characteristic scale eight measure the student's perception of how teachers feel toward him. Theoretically the student image is in part abstracted from data received

from teachers who are a prescribed audience of evaluation for the student role. Thus the level of the data received from teachers should be positively related to the level of perceptual organization of student image. Because achievement as a student emanates from maintenance and enhancement needs relative to student image a positive relation can also be expected between achievement level and level of perception of how teachers feel toward the student. High level students are expected to more frequently perceive that teachers feel about them in a manner that is enhancing of student image and generally highly valued within the student role.

The mean of High Over achievers was found to be significantly different from each of the other three criterion groups. Low Over achievers' mean was different from the mean of Low Under achievers. No other significant mean differences were found.

All twenty five items discriminated between High Over achievers and at least two or more of the other groups. Four items discriminated between Low Under and Low Over achievers. Three items discriminated between Low Over and High Under achievers in the predicted direction and one in the opposite of predicted direction.

The reliability estimates for scale eight are all of an acceptable magnitude, ranging from .87 to .96.

The null hypotheses of no differences between how the students perceive that teachers feel toward them are rejected for High Over achievers and for Low Under achievers when compared to Low Over achievers. It will be concluded that High Over achievers perceive that teachers feel toward them in significantly more enhancing terms than students in any of the other groups. Low Over achievers perceive that teachers feel toward them in significantly more enhancing terms than do Low Under achievers.

Characteristic Nine--Perception of Teacher's Image--Maintenance

The face validated items composing characteristic scale nine measure the student's perception of how teachers feel toward him. The rationale is the same as that for characteristic scale eight except that the adjectives presented on scale nine are at the maintenance level or are devaluing of student image. Thus the direction of predicted response is reversed from that of scale eight for high and low level students.

The mean of High Over achievers was found to be significantly different from the means of each of the other three criterion groups. No other significant mean differences were found.

Of the sixteen items all discriminated between High Over achievers and at least one other group. Three items discriminated between Low Over and Low Under achievers, one in the predicted and two in the opposite of predicted direction.

The reliability estimates for scale nine are of a high enough magnitude that results are interpretable with some caution. They range from .69 to .90. Part of the unreliability might be due to a problem of semantics related to meaning of the descriptions used. This is indicated by the difference in responses to item twenty, "A Procrastinator" and to item ninety two, "A Person Who Delays."

With the above caution in mind the null hypothesis of no difference between how students think teachers feel toward them is rejected for High Over achievers. It will be concluded that High Over achievers think that teachers feel toward them in terms of maintenance or average descriptions significantly less often than do students of any of the other three groups.

Characteristic Ten--Perception of Teacher's Image--Uniqueness

The face validated items composing characteristic scale ten measure the students' perception of how teachers feel toward them. The rationale is the same as that for characteristic scale eight except that the adjectives presented on scale ten are at an extremely high enhancement level or indicate uniqueness. Thus the high level students are expected to perceive of themselves in the manner described.

The mean of High Over achievers was found to be significantly different from the means of each of the other three criterion groups. No other significant mean differences were found.

Of the ten items two failed to discriminate. Seven items discriminated between High Over achievers and between Low Under achievers and at least one other group. Two items discriminated between Low Over and High Under achievers, one as predicted and the other in the opposite of predicted direction.

The reliability estimates for scale ten are extremely variant for the four groups ranging from .40 to .81. Due to the variation and generally low nature of the reliability any reported differences on scale ten may be due to hypothesized differences or to other factors measured by the scale. Upon inspectional examination of the items, scale ten may be measuring perception of uniqueness at two different degrees of intensity of relatedness to education. Those descriptions most directly related to education discriminated to a much higher degree than did those less closely related to education. This observation may account for some unreliability of the scale. The length of the scale, ten items, may also be related to the low reliability estimates.

With the above cautions in mind the null hypotheses of no differences between how students think that teachers feel toward them will be rejected for High Over achievers. It will be concluded that High Over achievers

think that teachers feel toward them in unique terms at a high level significantly more often than do students in any of the other three groups.

Characteristic Eleven--Significant Others

The items on characteristic scale eleven measure students' perceptions of significant others as they relate to student image and interaction within the student role. The rationale was that if others with whom a student interacts value highly and reward by esteem or approval attributes and activities valued in the student role this will increase the reward accruing to such attributes and activities. Such highly rewarding alternatives are likely to be chosen. High level students choose such student related activities and possess such attributes more frequently than lower level students. On this basis high level students are expected to perceive others related to the student role as more significant and also to have more significant others who value student related attributes and activities highly.

The mean of High Over achievers was found to be significantly different from the means of each of the other three criterion groups. High Under achievers' mean was found to be different from the mean of Low Over achievers. No other significant mean differences were found.

Of the twelve items six failed to discriminate. Five discriminated between High Over achievers and at least two other criterion groups. Two items discriminated between Low Over and High Under achievers, one as predicted and the other in the opposite of predicted direction.

The reliability estimates for scale eleven are of so low and variant a magnitude (-.90 to +.48) that no interpretation of results is possible without great possibility of error and misinterpretation. This may be due partly to the length of the scale, twelve items. However, five of the twelve items failed to discriminate and only five items made two or more

discriminations. Due to these results no interpretation of scale eleven is made. The fact that the means arranged themselves in an order other than predicted and different from any other scale give further indication of lack of interpretability of results. The finding that High Over achievers are significantly different from each of the other three groups may warrant a further attempt at definition and measurement of the relation of significant others to the academic syndrome.

The Total Instrument

The results reported for the four criterion groups on the total instrument provide an indication of the usefulness of the over all theory developed in chapter two and three. Of prime importance to the discussion of the results of the instrument is the reliability estimate for the instrument with the groups being studied. The over all reliability estimate was .95. The standard deviation of the instrument was 10.54 points. The standard error of measurement was 2.30 points. On the total instrument the grand mean of all groups was 111.96. Considering the magnitude of the mean and standard deviation the standard error of measurement is certainly of an acceptable magnitude. Results on the total instrument can thus be interpreted within a reasonably small 68 percent confidence interval ($\pm$ 2.30) and, if deemed necessary, even within a reasonably small 95 percent confidence interval ($\pm$ 4.60).

The total instrument discriminated at the .05 level between the High Over achievers and each of the other three groups. It also discriminated at the .05 level between the Low Under achievers and each of the other three groups. It failed to discriminate between Low Over achievers and High Under achievers.

The null hypotheses of no differences between groups on the aggregate of theorized characteristics of the instrument will be rejected for High Over achievers and for Low Under achievers. It will be concluded

that High Over achievers are significantly above each of the other three groups on the aggregate of the theorized characteristics. Also, Low Under achievers are significantly below each of the other three groups on the aggregate of the theorized characteristics. No significant difference was revealed between High Under and Low Over achievers on the aggregate of the theorized characteristics.

Upon further analysis it is seen that the instrument discriminated between each pair of groups in which there was a significant grade point difference. The one pair between which it was theorized that there existed no significant grade point difference, the Low Over-High Under comparison, the total instrument failed to discriminate. These two groups were statistically significantly different on motivation level which might indicate that the instrument is measuring factors associated with achievement rather than motivation level. Further evidence for this interpretation is given by the fact that the instrument discriminated between High Over and Low Over achievers and between High Under and Low Under achievers. There was no demonstrated motivational difference between these two pairs but there was a significant difference in grade point level. From this evidence it might be concluded that the instrument measures factors associated with achievement level rather than with motivation level.

The above conclusion would suffice if it were not for the findings uncovered by further analysis. Each of the extreme groups was discriminated from each of the other three groups. Because of the apparent unique nature of these two groups there may be, within each of the motivational classifications, over and under achievers, a significant difference on motivation level. All over achievers are defined as being highly motivated. However, the type and intensity of motivational factors associated with the highest grade level over achievers might be different than the factors associated in general with over achievers. The same

might be true of the type and intensity of motivational factors associated with the Low Under achievers relative to general under achievers.

In review, the instrument identified significant differences within both the high motivation level over achievers and the low motivation level under achievers. It also failed to identify differences between the highly motivated Low Over achievers and the low motivated High Under achievers. These results lead to one of two conclusions. One, the instrument measures factors associated with grade point level and does not measure factors associated with motivation level or, two, the method of classification of students on motivation level is inappropriate. The classification must be refined and improved so that students classified in the same motivation category are homogeneous on motivation level. Also an attempt must be made to identify motivational differences among students not only at the extremes but around the mean.

Possibly the use of aptitude as a predictor of expected grade point level is the weak factor in the present process of identification of motivation level. The use of academic output as assessed by a combination of measures of academic achievement might prove to be a more useful criterion of motivation level in the presently employed student context. It is frequently observed that few students in the present American culture use even close to the maximum of their academic potential. Under such circumstances aptitude level is a measure of a factor theoretically important to achievement at a one to one level but practically related to achievement at a much lesser ratio. Under such conditions it might be best to measure output level directly rather than related to aptitude level.

In reviewing the results of the eleven characteristic scales it is found that the greatest effectiveness was attained in measurement of the two extreme groups, especially the High Over achievers. The High Over achievers are a unique group. The Low Under achievers are not

as unique at the opposite end of the continuum but still tend to be quite different from the other groups on many characteristics. The differences between the High Over achievers and Low Under achievers were more extreme than between High Over achievers and either Low Over or High Under achievers.

High Over Achievers

High over achievers are unique in that their self concepts are organized at a high and different level. Furthermore, their student images are important to their self concept. They have internalized school values and norms to a high degree. Frequently they engage in activity generally regarded as valued or rewarding. They often choose to engage in educationally related activities. They think that teachers would describe them most often in terms of an enhancing and unique nature. Infrequently do they feel teachers would describe then in average or maintenance level terms.

Low Under Achievers

Low under achievers are a group of students whose self concepts are organized at a minimum level and who only infrequently view themselves as unique. They have not internalized school values and norms to a high degree and tend frequently to engage in activities that are generally not considered rewarding. Also, they frequently engage in non educationally related activities in preference to educationally related ones. Low under achievers do not think that teachers would often describe them in enhancing terms.

Low Over and High Under Achievers

The two groups were defined as being different on motivation level. A closer examination of differences between the low over and high under achievers might give some insight into the characteristics which might be symptomatic of such a defined motivational difference where little or no grade point difference exists. In this study, little difference was found between these two groups. They can be considered to be someplace near the middle of a continuum between High Over and Low Under achievers tending to be closer to Low Under than High Over achievers.

Three mean differences were revealed between the Low Over and High Under achievers. Two of these were on the two least reliable scales, scale six and eleven. On all three of these scales High Under achievers were higher than Low Over achievers which is the opposite of motivation direction as defined in this study. These three characteristics, interpreted with the cautions discussed, indicate that High Under achievers have organized their student image at a higher level and more frequently engage in activities regarded as valuable or rewarding than Low Over achievers.

A review of the twenty items on which High Under achievers scored significantly higher than Low Over achievers indicates that High Under achievers place a higher value on further education, especially college, and that they more often want to be and think of themselves as non conforming or different than do Low Over achievers. They also choose to do homework, to study, to read and to engage in school related activities more often than do Low Over achievers.

Upon examination of the seventeen items on which Low Over achievers scored higher it is found that they tend to think teachers view them as ambitious and motivated and at the same time as indifferent, inefficient and as "goof offs" more often than High Under achievers.

They tend to value and choose school related rewards, prizes and records more frequently then High Under achievers. On these same items the High Under achievers tend to value more highly and choose more frequently values, material rewards and professional rewards outside the field of education. Low Over achievers plan ahead more often and tend to think subjects are more worthwhile and worry more about them more than do High Under achievers.

A snythesis of the above made as an indication of further factors to investigate relative to these two groups that differ on motivation but not on grade point level elicits the following characteristics: 1) short length of involvement with educational plans (Low Over), 2) conformity (Low Over) and difference (High Under), 3) punishment or low value associated with study, homework and related activity (Low Over), 4) success deprivation and worry about success, especially school success (Low Over), 5) high value on and involvement in non education related goals and rewards (High Under), and 6) idea of self as unusual in the non enhancing or "character" sense (High Under).

Adequacy of Theory

Within the limitations previously discussed relative to reliability estimates, size and uniqueness of sample and the results of item and scale analysis the following indications as to the adequacy of the self economy theory are warranted. The theory successfully elicits hypotheses from which differences between different criterion groups of students can be identified. Each of the eleven theoretically derived hypotheses tested in the study differentiated High Over achievers from the other criterion groups. Seven of the hypotheses further differentiated Low Under achievers from one of the average achieving criterion groups. On this basis the theory may tentatively be accepted as adequate for

distinguishing among groups of students at three points on a grade point continuum, the very high (High Over Achievers), the average (Low Over and High Under Achievers) and the very low (Low Under Achievers). Theory deduced hypothesized differences were not found between groups of students differing on motivation level and not differing on grade point level. This suggests that the theory might be explanatory of the way in which students perceive of themselves due to their position on the academic or grade point hierarchy. It appears to explain this rather than explaining factors which might have been responsible for the development of such an achievement level initially. Thus the theory is probably more useful in explaining and predicting the perceptions of students after their student image is formed at a certain level rather than in explaining how it was formed at that level. Its present diagnostic and future predictive usefulness is indicated by the present study as being greater than its value in assessment of past developmental factors or characteristics.

Summary

In chapter six the results of the item analysis and means tests were discussed. Characteristic scale reliability estimates of below .70 placed severe restrictions on interpretation of results of five scales and made unrealistic the interpretation of two scales. On the four scales on which the average realiability estimate exceeded .70 the results were more univocally interpretable. The reliability estimate for all groups over the total instrument of .95 enabled more clearly defined interpretation of results.

The results on the instrument differentiated three groups of students at achievement levels, high, average and low. In general the differences on each characteristic were somewhat proportional to and in the same

direction as the differences in grade point average. Thus the following description drawn from the characteristics studied applies with greatest accuracy to High Over achievers, with somewhat less accuracy and to a lesser extent to average achievers (Low Over and High Under achievers) and least to Low Under achievers.

The student image is important to self concept (1) and is perceptually organized at a high or enhancement level (2) (3) containing substantial elements of uniqueness (4). School values and norms are internalized to a high degree (5) and educationally related activities are often perceived as rewarding and engaged in freqnently (7). It is perceived that teachers most often think of them in enhancing (8) or even unique (10) terms and rarely think of them in average or maintenance terms (9).

Each criterion group was discussed related to the above characteristics. Six possible differences between students at the same grade point level but different on motivation level (Low Over and High Under Achievers) were suggested. Lastly the adequacy of the theory for explaining achievement level differences and its indicated use as a predictive or diagnostic tool rather than its use in a developmental context was discussed.

CHAPTER VII

SUMMARY, CONCLUSIONS, RESEARCH IMPLICATIONS

Summary

The major problem of this study was to test the predictive utility of a theory of academic achievement motivation on male students. From the theory a series of hypotheses were deduced relative to differences between males who varied on achievement level in relation to aptitude and who differed on achievement level alone. As a pilot test of these hypotheses four criterion groups of male students were identified. These groups were High Over achievers who were high in motivation and grade point level, Low Over achievers who were high in motivation and average on grade point level, High Under achievers who were low in motivation and average on grade point level, and Low Under achievers who were low in motivation and low on grade point level. All students (35 in each group) were selected from the sample of students used by Farquhar and associates.[1]

These four criterion groups of students were administered one hundred and eighty one items drawn from the Human Trait Inventory, Preferred Job Characteristics Scale, Generalized Situational Choice Inventory and Word Rating List developed by Farquhar and associates.[2]

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[1]William W. Farquhar, A Comprehensive Study of the Motivational Factors Underlying Achievement of Eleventh Grade High School Students, Research Project No. 846 (8458), Supported by the U. S. Office of Education, in cooperation with Michigan State University, 1959.

[2]Ibid.

Those items were chosen to which inferences about direction of answer could be made based on the theoretically deduced hypotheses. The items chosen were grouped around eleven of the hypotheses. For this reason the total instrument of one hundred and eighty one items was divided into eleven characteristic scales each inferrentially related to one of the eleven hypotheses.

A Chi-square analysis was done on each item to determine item discrimination between each of the six possible pairs of criterion groups. One hundred and sixty items were found to discriminate between at least one pair of criterion groups at the .10 level of significance or better.

Each of the four criterion groups' mean score was compared with each of the other criterion groups' mean score on the eleven characteristic scales. Hoyt's reliability estimates (internal consistency) were presented for each criterion group on each characteristic scale. Reliability estimates on two characteristic scales were low enough to preclude any interpretation (average range from -.08 to +.06), on five other characteristic scales they were of a useable but questionable magnitude (average range from +.39 to +.70) and on four characteristic scales they were of a generally acceptable magnitude for interpretation (average range from +.72 to +.93). With the necessary cautions in interpretation due to non-consistency within a scale the mean differences between pairs of criterion groups on each characteristic scale were presented. A summary of these differences is reported in Table 7.1, on the following page.

Lastly, an analysis of mean differences between each pair of criterion groups was made on the total instrument scores. The Hoyt's reliability estimate for the total instrument over all four criterion groups was found to be .95. The total instrument discriminated at the .05 level of significance between: High Over > Low Over, High Over > High Under, High Over > Low Under, Low Over > Low Under and High Under > Low Under achievers. It failed to discriminate between Low Over and High Under achievers.

Table 7.1. Summary of Differences in Means of Four Criterion Groups on Eleven Characteristic Scales

Legend:	HO = High Over Achievers	HU = High Under Achievers
	LO = Low Over Achievers	LU = Low Under Achievers

Characteristic Scale		Differences Significant at .05 Level		
1	Importance of Student Image	HO > LO	HO > HU	HO > LU
2	Level of Self Concept	HO > LO	HO > HU	HO > LU HU > LU
3	Level of Student Image	HO > LO LO > HU	HO > HU LO > LU	HO > LU HU > LU
4	Level of Uniqueness	HO > LO	HO > HU	HO > LU HU > LU
5	School Values and Norms	HO > LO	HO > HU LO > LU	HO > LU
6	Student Related Activities	HO > LO LO > HU		HO > LU HU > LU
7	Educational Activities	HO > LO	HO > HU LO > LU	HO > LU
8	Enhancement Image	HO > LO	HO > HU LO > LU	HO > LU
9	Maintenance Image	HO > LO	HO > HU	HO > LU
10	Unique Image	HO > LO	HO > HU	HO > LU
11	Significant Others	HO > LO LO > HU	HO > HU	HO > LU

Conclusions

On the basis of the results of the present pilot study several tentative conclusions are made.

From the item analysis it is concluded that:

1) Items can be constructed which significantly differentiate among groups of students who have been defined as differing in motivation and grade point average.

2) In the main, the functioning of the above items can be accounted for by theory.

3) These items discriminate to a higher degree when the two groups being compared differ on grade point average alone or on grade point average and motivation than when they differ on motivation alone.

From the results of characteristic scale analysis it is concluded that:

1) The eleven hypothesized characteristics deduced from the theory of academic motivation are significantly related to differences among students at different achievement and motivation levels.

2) The eleven hypothesized characteristics effectively differentiate students at a high motivation and high grade point level from other students at different and lower levels of motivation and grade point.

3) Seven of the eleven hypothesized characteristics significantly differentiate students low in motivation and low in grade point average from other groups of students who are average in grade point average.

4) The hypothesized characteristics fail to significantly discriminate between groups of students who are different in nominal classifications of motivation but who have nearly the same grade point level.

5) Tentatively it might be concluded that these eleven characteristic scales are measuring factors associated with differences in grade point level alone rather than grade point level related to aptitude as a predictor of achievement level.

From the results of analysis of the total instrument it is concluded that:

1) A reliable instrument can be constructed to measure the differences between students hypothesized by deduction from the theory.

2) A self economy theory can account for gross differences among students at different grade point levels, especially at the highest grade point level.

3) Differences among students at different grade point levels are not unidimensional.

4) Differences among students are successfully mirrored in the students' perception of how teachers feel toward them.

Research Implications

A number of suggestions for further research are made on the basis of the above results and conclusions.

1) A study similar to this using the same instrument might be made on females to test the further utility of the theory.

2) To further study the tentative conclusion that this instrument measures factors associated with grade point level a study using differently selected criterion groups is suggested. The instrument could be administered to groups differing on grade point level and to groups differing on observed grade point level relative to expected grade point level as set by aptitude.

3) The instrument might be administered to students differing only on aptitude in an attempt to identify the importance of the aptitude factor relevant to motivation and grade point factors being measured.

4) Criterion of academic achievement other than grade point average, might be used. Achievement test results, teachers ratings, or a combination of the two might be chosen.

5) An attempt might be made through interviews or other instruments to differentiate between under achievers who are maintaining their self concepts at a high level through interaction in roles other than the student role from under achievers whose self concepts are at a low level.

6) An attempt might be made through interviews or questionnaires to identify the significant others of students at different achievement levels and to study differences which might be found in quality or quantity of significance.

7) The six factors vaguely identified by this study as possible differences between high under achievers and low over achievers might profitably be pursued as potential indicators of factors associated with "motivational" differences not coupled with grade point level differences.

8) A factor analytic study might be carried out using the items from the instrument used in the present study. Such a study might purify statistically the characteristic scales used in this study. A comparison study of the similarities and differences between the theoretically derived characteristics and the face validated characteristic scales used here and the factorially validated scales elicited from a factor analytic study would be of great value.

9) A predictive study might be done using the discriminating characteristics and items found through this study. An instrument composed of these items might be administered to high school students and the degree of success of prediction of their grade point averages based on scores on the instrument might be made. A multiple regression equation for grade point prediction might be built using the scores on the instrument and aptitude test scores in combination.

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APPENDIX

PREFERRED JOB CHARACTERISTICS SCALE

Directions:

What kind of a job do you prefer? In the following items you will find two job characteristics paired. From each pair choose the one characteristic you value most for your future job, after your education. If you prefer characteristic "a" then mark in the column for response "a" on the special answer sheet. If you prefer "b" then mark in the "b" column. Ignore columns "c", "d", and "e". Be sure to mark only one choice for each pair. Do not omit any items. In some cases it will be hard to make a choice between the items because you may want to choose both items or neither. But, remember, you must make a choice. This is a survey to find out your job preferences. There are no right or wrong answers.

If you have any questions raise your hand and ask the examiner. Be sure to fill in the spaces at the top of the answer sheet.

If there are no questions turn the page and begin!

PLEASE DO NOT WRITE ON THIS BOOKLET

THE GENERALIZED SITUATIONAL CHOICE INVENTORY

This is a survey of your choices. There are no right or wrong answers. The results will in no way affect your grades in school.

The inventory is made up of pairs of statements. Read each pair carefully. Choose the one you would most prefer or like to do.

Answer all questions as honestly and frankly as you can. Only in this way will the results be meaningful. Remember this inventory is about you and you alone. This is not a survey of what you can do, but of what you would like to do.

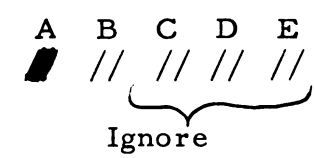
Do Not Write On This Booklet. You will be given an answer sheet and a special pencil to mark your answers with. Mark between the two small lines under the letter of your choice.

EXAMPLE:

Which would you prefer to do?

1. a.) Go to a party
   b.) Read a book

Answer Sheet



This person marked under the letter "A" on the answer sheet which means that he would prefer to go to a party to reading a book. Ignore columns "C", "D", "E".

If you have any questions, raise your hand. If not, turn to the next page and answer all the questions. Do Not Skip Any Questions! Work as rapidly as you can and do not spend too much time on any one item.

Remember this is not a survey of what you can do but of what you would prefer to do.

PLEASE DO NOT WRITE ON THIS BOOKLET

WORD RATING LIST

Following is a list of words teachers may use to describe students. You are to rate yourself on each word as you think your teachers would rate you.

Be sure to describe yourself as your teachers would, not as you would describe yourself.

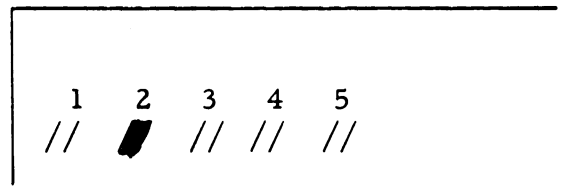
Read each word carefully, then decide which of the following ratings would be chosen by your teachers to describe you.

Rating Number	Meaning of Number
1	This word would never describe me.
2	This word sometimes describes me.
3	This word usually describes me.
4	This word always describes me.

After you decide how your teacher might rate you, mark the special answer sheet. Use the pencil provided and make heavy marks. Ignore column "5".

Example:

1. Happy 1 2 3 4



This individual has chosen the rating number "2" for the word "happy". This means that he feels that his teachers think that the word "happy" sometimes describes him.

If you have any questions, raise your hand. If not, turn to the next page and begin rating all of the words. Do Not Skip Any Words. Work as rapidly as you can and do not spend too much time on any one word. Remember you are not to use column "5".

Remember you are to rate each of the words as you think your teachers would in describing you.

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HUMAN TRAIT INVENTORY

GENERAL DIRECTIONS: PLEASE READ CAREFULLY!

Following is a list of statements about YOU. Read each statement carefully! Then decide whether this statement is how you always feel, usually feel, sometimes feel, or never feel.

Number	Meaning of Number
1	This statement would never describe the way I feel.
2	This statement sometimes describes the way I feel.
3	This statement usually describes the way I feel.
4	This statement always describes the way I feel.

Answer each statement - - Do not leave any blank.

There are no right or wrong answers. The answers apply only to you. The way you answer these statements will not affect your school marks in any way. Mark between the lines under the number that best describes how you feel.

EXAMPLE:

1. I feel it is always a good thing to be honest.

		1	2	3	4	5	
Answer Sheet	1.	//	▮	//	//	//	(Ignore Column 5)

This individual has chosen number "2" for the statement "I feel it is always a good thing to be honest." This means he feels that this statement sometimes describes him.

In marking your answers on the separate answer sheet, be sure that the number of the statement in the booklet is the same as the number on the answer sheet. It is best to mark your first impression, try not to change your answer. If you change an answer, erase completely your first choice and then blacken between the lines under the other column.

Be sure to fill in all the information at the top of the answer sheet, name, age, sex, date today and so on.

Remember to answer the statements as they apply to you!

PLEASE DO NOT WRITE ON THIS BOOKLET

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