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ABSTRACT

This guidebook was designed to familiarize educational practitioners--teachers, developers, counselors, administrators--with several concepts of motivation and methods of measuring them. Six concepts, or approaches, that are particularly relevant to understanding motivation in education are considered: achievement motivation, locus of control, curiosity and arousal seeking, anxiety, general academic motivation, and motivation and attitude. For each of these concepts, a brief explanation is provided, together with a summary of principles, some suggestions for applying this knowledge, and descriptions of measurement instruments selected on the basis of their availability and applicability in an educational context. A bibliography is included. (Author/BBM)

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A PRACTITIONER'S GUIDE TO CONCEPTS AND MEASURES OF MOTIVATION

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PREFACE

This guidebook was designed to familiarize educational practitioners--teachers, developers, counselors, administrators--with several concepts of motivation, and methods of measuring them. Unfortunately, there is no such thing as a single concept or entity that we can call motivation. We can usually recognize motivated people when we see them, but we do not have simple, straightforward explanations of how to produce motivated behavior.

Presently there are several concepts that explain different aspects of motivation. Some are more comprehensive than others, and some overlap to a degree. But each contributes to a full understanding of the dynamics of motivation. We have included six concepts, or approaches, that are particularly relevant to understanding motivation in education. Each chapter of this guidebook provides a brief explanation of the concept, a summary of principles, and some suggestions for applying this knowledge, as well as descriptions of selected measurement instruments. These were selected on the basis of their availability and applicability in an educational context. The authors may be contacted for further information or assistance in locating measurement instruments.

We would like to express our sincere gratitude to the ERIC Clearinghouse on Information Resources for their support, and particularly to Barbara Minor for her willing and expert assistance.

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MOTIVATION IN SCHOOL:

A PRACTITIONER'S GUIDE TO CONCEPTS AND MEASURES

INTRODUCTION

This guidebook was prepared as an answer to the question, "Can you recommend a measure of motivation for me to use?" This question is frequently asked by other instructional technologists, teachers, curriculum developers, and assorted educational consultants, and this guide has been prepared with this audience in mind. We have tried to accomplish several goals, not all of which are indicated by the title.

This document is intended to help practitioners understand the concept of motivation and its influence, as well as its measurement in school life. Understanding motivation is just as much a conceptual dilemma as it is a measurement problem. It is conceptual in that the term motivation has been used in such an all-encompassing manner by educators as to refer to all of the affective components of personality and environment that influence effort as opposed to ability. There is a relatively stable construct called ability, or intelligence, that serves as a reasonably good predictor of performance. There are various measures of ability that are correlated with each other, which suggests that they may be measures of the same thing. Furthermore, the construct called general ability can be analyzed into fairly stable traits that represent different types of abilities (e.g., Cattell, 1971; Cronbach & Snow, 1976; Guilford, 1967).

We are not so fortunate when it comes to motivation. The traditional nature-nurture argument in psychology still produces, not different

explanations for a stable construct as in the area of ability studies, but substantively different explanatory theories. On the one hand, there are environmental theories based on conditioning principles and physiologically-based drives (e.g., Hull, 1943; Skinner, 1953). On the other hand, there are the humanistic theories that postulate a fundamentally free will at the root of motivation (Rogers, 1951). The position taken by the present authors is that of social learning theory which assumes that motivation and behavior are the result of interactions between a person and the environment. This work follows in the tradition of Tolman (1949), Lewin (1935), and a host of recent and current researchers who have worked on specific aspects and extensions of it. An excellent recent review of these social theories of motivation is that of deCharms (1978). Although it is too brief to stand alone as an introductory reading, it covers the relevant topics and has references to more extensive readings.

Within the general context of social learning theory, the motivational theory that has guided the organization and content of this document is known as expectancy-value theory. This theory assumes that effort, or movement toward a goal, is the result of two factors. The first is the motive, need, or valued-end (Feather, 1975) toward which behavior is directed. This assumes that human behavior tends to be purposeful and goal directed. The second factor is expectancy for success. The greater the likelihood that a person perceives success to be possible, the stronger the effort that is likely to be exerted. Note that we are not referring to the actual probability of success, but to the subjective probability, or personal conviction, that success is possible. Motivation is the combined result of the personal value

attached to the attainment of a given goal and the perceived likelihood of achieving it. Thus motivation results in effort being exerted toward the accomplishment of the goal. Eventual success or failure will depend upon a combination of motivation and other factors including personal ability and opportunity.

Accordingly, two major parts of this document cover need for achievement, one of the major motives that has been studied in conjunction with academic performance, and locus of control, one of the major approaches to understanding subjective expectancies for success or failure. If, however, the problem in understanding motivation could have been subsumed in two such neat categories, the problem would have been simple. There are other factors in motivation of sufficient importance to warrant separate attention.

There are undoubtedly differences among people in terms of their general level of curiosity and information seeking behaviors. Whether these characteristics can be subsumed under the general category of motives or needs in our expectancy-value theory is a theoretical issue of some concern. Regardless of the eventual outcome of that concern, curiosity is a motivational characteristic of sufficient practical interest to educators to deserve inclusion as a special topic.

Another area of major concern is anxiety. A certain amount of anxiety seems to facilitate motivation; it heightens our senses and makes us more responsive to our environment. However, almost everyone in education has probably experienced the effects of debilitating anxiety. We have seen people in whom the fear of failure so inhibits the effective use of their capabilities that fear itself becomes the root of a self-fulfilling prophecy. Therefore, a section on this basically debilitating influence on motivation is included.

In each of the previously described sections of this document and in a section on measures of general academic motivation, background information on the concept, and a summary of the current state of knowledge about it and what the practitioner can do about it, are provided. Also included are brief descriptions of related measurement instruments which were selected on the basis of their ready availability, psychometric quality, and ease of use. In some cases one or more of these criteria were not met by a particular instrument, e.g., a description of the Thematic Apperception Test is included in the section on achievement motivation. This is not an easy test to use, but the test itself was a central part of the development and application of this concept. An understanding of this test helps considerably in understanding the concept.

An effort has been made to summarize reliability coef[illegible]nd validational evidence wherever possible. They will assist[illegible]rs who are familiar with these indicators of the quality of a measur[illegible] Anyone who tries to measure human characteristics should obtain at least an elementary understanding of reliability in validity. An excellent readable source is Anastasi (1976).

Reliability refers to the stability of a test. If a person's attitudes or psychological orientation remain unchanged, then that person should obtain essentially the same rank when retested on the same measure. To the extent that the test has ambiguously worded items or is influenced by transitory states of mind, the test will be unstable, and the person's score will fluctuate. The higher the reliability coefficient--it usually ranges between 0.0 and 1.00--the greater the stability. Coefficients in excess of approximately .65 are usually

adequate for most research purposes, but not for individual counselling purposes. The reader should have special training or be thoroughly familiar with the issues covered by such experts as Anastasi (1976) or Meehl (1954, 1957) before attempting to interpret an individual's behavior on the basis of a single psychological test.

Validity refers to the degree to which an instrument measures what some person says it measures. Scores on the instrument should be correlated with scores obtained from other instruments that measure the same thing, and they should be uncorrelated with scores from instruments not designed to measure the same thing. We know of no perfectly reliable or valid measures, and, consequently, we have included some measures with qualifications when they seemed to have other redeeming characteristics. Recent reviews of measures of motivation that contain more psychometric information are Clarke (1973), Fineman (1977), Johnson and Bommarito (1976), and Moen and Doyle (1978).

Finally, we have included a section on attitude. Most of us who received training in education were taught that school behaviors can be classified as cognitive, affective, or psychomotor. While this classification scheme is certainly valid from one perspective, it has better served the needs of understanding the cognitive domain than the motivational. Bloom (1976), for example, still prefers to think in terms of affect rather than motivation since the concept of affect relates to traditional approaches in defining learning tasks. The preference in this document is for the term motivation. This term refers to a history of conceptual and theoretical work aimed at understanding the determinants of individual effort. We believe that it is in this context that educators will find the most effective approaches to analyzing individual

differences and for discovering interventions that influence individual effort. In this process, we need to understand the traditional approaches to measuring attitude. Many of these same approaches are part of the processes for measuring motivational concepts; therefore, a major section of this document focuses on this important topic.

1. ACHIEVEMENT MOTIVATION

1.1 What Is Achievement Motivation?

A desire to feel competent and to exercise one's competence by achieving a standard of excellence is present to a greater or lesser degree in all of us. This goal may be manifested in career goals, interpersonal relationships, or personal hobbies, but the key characteristic is the desire to achieve a prescribed level of excellence in a given pursuit. This desire, or motive, is known as achievement motivation. It was originally defined by Murray (1938) as

> the desire or tendency to do things as rapidly and/or as well as possible...to accomplish something difficult. To master, manipulate and organize physical objects, human beings, or ideas. To do this as rapidly, and as independently, as possible. To overcome obstacles and attain a high standard. To excel one's self. To rival and surpass others. To increase self-regard by the successful exercise of talent (p. 164).

For this reason writers often refer to the Greek god Hermes as epitomizing achievement motivation. As the messenger of the gods and the guide of travellers, he symbolizes exploration, adventuresomeness, and invention (by noon of the first day of his birth, he had invented and learned to play the lyre). And, as the patron of athletic events, he had a keen interest in competition. In one way or another the achievement oriented person gains satisfaction from matching or exceeding a standard of performance. This might be indicated by outperforming someone else, meeting or surpassing some self-imposed standard of excellence, doing something unique, or being involved over a long time in doing something well where there is a clear indication of an achievement goal.

Achievement motivation is but one of a number of motives that have been identified within this area of research. Murray (1938) developed a

taxonomy of 20 major motives, or needs, that influence the direction of behavior for a person (e.g., achievement, affiliation, dominance, nurturance). Maslow (1954) reduced this to a list of five categories of needs which are hierarchical in nature: physiological, security, affiliation, esteem, and self-actualization needs. Lower order needs must be sufficiently satisfied before a person will experience a desire to satisfy a higher order need.

A problem with both of these early efforts was that of measurement; it was difficult to obtain stable and dependable measures of these psychological states. Murray invented the Thematic Apperception Test (TAT), which operated by providing examinees with an ambiguous picture to which they responded by fantasizing and writing a story. These stories are analyzed for clues that reveal an individual's predominant needs.

However, it was McClelland (1953) who invented a highly reliable technique for analyzing and scoring these tests. After being trained, different raters would score the same tests and come up with very similar scores. This accomplishment provided a reliably derived numerical score that facilitated the use of this test in empirical research studies. Furthermore, McClelland focused his attention on the need for achievement as a potent and useful concept for the study of behavior in our culture. He later added the needs for affiliation and power and has continued in depth studies of the influences of these motives on the behavior of individuals, groups, and even entire cultures (McClelland, 1976). One of his early associates, John Atkinson, has elaborated the theory of achievement motivation in relation to individual behavior (Atkinson & Raynor, 1974).

Because of its obvious relationship to a concern for competing against a standard, achievement motivation has been singled out as one of the motives most likely to be related to successful school performance. Both Alschuler (1971, 1973) and deCharms (1976) have conducted extensive studies of techniques designed to foster the development of need for achievement in children. While their work parallels the workshops that have been designed for use with adults in business and other contexts (McClelland & Steele, 1972), it has been modified for a school context.

1.2 What Do We Know About Achievement Motivation?

Achievement motivation has both a theoretical and an empirical basis, and similar behaviors have been observed in business, schools, and other settings with persons who have high need for achievement (nAch). It should be pointed out that there are some rather persistent similarities in the child-rearing practices of mothers whose children develop a high nAch. Mothers of these children are more likely to encourage and reinforce a child with physical affection for trying new things by himself, making his own friends, and doing well in competition; all of these efforts are directed at encouraging initiative and independence. These tasks should not be confused with the development of purely "caretaking" tasks such as encouraging children to go to bed independently, eat well alone, or look after their possessions (McClelland et al., 1953). It is easy to see how this type of training is related to several of the predominant characteristics of the achievement oriented person. Six of the more consistent of these characteristics, particularly as they relate to school contexts, are listed below.

1. High nAch persons prefer situations in which there is some risk of failure, or, in other terms, there is a moderate probability of success (Atkinson, 1974). They like success, but success without a challenge has no pleasure. In contrast, a person low in nAch may choose tasks in which success is either assured or almost impossible because both situations allow the person to avoid anxiety. The almost impossible task may be chosen either because it allows the person to attribute failure to things she/he had no control over, or because the person likes the glory to be obtained from trying to make the long shot.

2. The intrinsic reinforcement of success itself, rather than extrinsic rewards such as money or prestige, is the key factor in the motivation of these persons. When faced with the choice, they will choose experts over friends as work partners (French, 1956; McClelland & Winter, 1969), and they will work just as hard to accomplish success whether or not money is added as a reward (Atkinson & Reitman, 1956; McClelland, 1976).

3. They tend to make realistic vocational choices. The high achievement oriented person who does not suffer from an excessive degree of anxiety or fear of failure will tend to be realistic in assessing his competencies and matching them to appropriate vocational goals (Mahone, 196 : Morris, 1966).

4. They prefer situations where they have, or perceive themselves to have, personal control over the outcomes of their efforts. They prefer to feel personally responsible for their successes and to make their own evaluations and judgments of situations rather than relying on other authorities (Heckhausen, 1967; Weiner, 1972).

5. They have a relatively long future time perspective; that is, they tend to project their goals farther into the future than low nAch persons (McClelland et al., 1953; Raynor, 1974). They also feel that time is rushing by very rapidly (Knapp & Green, 1960), and that they do not have enough time to get things done (Knapp, 1962).

6. They do not necessarily have a higher grade point average in school. This is because grades may be sought for many reasons including a host of extrinsic rewards. For example, high grades may be related to financial reward for some persons, personal power for others, and relief from family pressure for still others. Grades do not serve as a simple indicator of intrinsically satisfying accomplishment. For these reasons, there is not always a high correlation between nAch and grades. In fact, the high nAch person might even forsake a high grade if obtaining it meant sacrificing high quality accomplishment in order to meet the idiosyncratic demands of a particular instructor.

For more details on these and other characteristics of need for achievement in relation to behavior, the reader will find comprehensive reviews in Alschuler (1973), Atkinson & Raynor (1974), and Weiner (1972).

1.3 What Can the Practitioner Do About Achievement Motivation?

An extensive amount of work has been done in both educational (Alschuler, 1973; Alschuler et al., 1971; deCharms, 1976) and entrepreneurial contexts (McClelland, 1976; McClelland & Winter, 1969) to try to influence the development of achievement motivation with different age groups and different cultures. Throughout these efforts to influence behavioral change, there are some common efforts.

One of the first requirements for increasing achievement motivation is for the trainer to realize that one is not creating a motive that did not previously exist in an individual. It is important to recognize that nAch is but one of many motives that make up the personality. To change nAch is to change its position in the hierarchy of an individual's motive structure, and there are several approaches to bringing about such change.

One approach, which would be that of the behaviorist, would be to identify achievement-type behaviors and to systematically reinforce those behaviors while withholding reinforcement from other clusters of behavior that were most characteristic of the individual. The withholding of reinforcement would be particularly important with behaviors that compete with the development of nAch. It can be flattering to a parent or teacher when a child expresses a need for assistance and a happy willingness to imitate the adult's behavior; however, the adult sometimes needs to resist this patronizing and to encourage the child to find his/her own way to solve the problem.

While the behavioral approach has merit, it is not the approach generally used by nAch trainers. They have found it to be more effective to deal directly with the individual's cognitive structure in addition to his/her behaviors. Alschuler (1973), based on the work of McClelland and Winter (1969), has summarized the propositions that support the change of achievement motivation as follows:

> (1) clarifying and labeling the cluster of achievement thoughts by teaching the elements of achievement planning; (2) relating these thoughts to the appropriate expressive style (moderate risk taking, initiative, using concrete feedback, planning ahead carefully, etc.); and (3) applying these thoughts and actions to appropriate life contexts (e.g. entrepreneurial-type situations) (p. 34).

This is accomplished in part by designing experiences that encourage the development of personal values that are parallel to these propositions. It is assumed that creating a greater value for achievement will, when combined with practical exercises and reinforcement, generate a more long-lasting, self-sustaining need for achievement.

In practice the course designed by Alschuler (1973) to increase achievement motivation in teachers and children involves a four-step process. The first is aimed at teaching participants to recognize and use the language of four nAch action strategies: realistic goal setting, proper use of feedback, personal responsibility, and assessing the environment. The second is to learn to use nAch thoughts and goal-setting and to distinguish these from other goals such as need for affiliation and need for power. Step three includes self-study; the student must try to relate the nAch syndrome to specific areas of his own life. The final step requires actual goal setting and practice. The student actually applies what has been learned to a personal achievement goal (Alschuler, 1973, pp. 148-149).

1.4 Measures of Achievement Motivation

The names of the six tests and scales reviewed are listed together with their recommended age groupings in Figure .

Projective Measures	Age Level
Thematic Apperception Test	Middle school to Adult
French Test of Insight	Middle school to Adult
Scales	
Prestatie Motivatie Test	Grade 3 through College
Achievement Motives Scale	Grade 9 through College
Resultant Achievement Motivation Test	Grade 9 to Adult
Sentence Completion Test	College and Adult

Figure 1. Six measures of achievement motivation.

1. Thematic Apperception Test (TAT)

Authors: Henry Murray (1938); David McClelland (1953)

Description: Traditional with researchers and counselors, the most commonly used measure of the achievement motive is the Thematic Apperception Test (TAT). Originated by Murray, it was revised by McClelland in several respects, including an improved scoring system. The TAT is a projective test in which examinees view an ambiguous picture for 20 seconds, then write an imaginative story based on the picture. This process is repeated with several, usually four, other pictures. The stories are then scored on the basis of several carefully determined criteria that indicate the presence or absence of an achievement orientation. For example, one picture shows a boy in a

checkered shirt sitting at a desk with a book open, but he is staring pensively into space. This excerpt is taken from a high achievement motivation story (McClelland, et al., 1953): "The boy is a high school study who is giving deep thought to his studies...He is thinking about a solution to the problem before him. He is striving to reach some definite conclusions." Low achievement motivation stories often contain statements such as, "The inability of the student to concentrate on the lecture has caused him to pass the time by daydreaming. He is thinking of the house party coming up the following weekend..." The TAT takes about 30 minutes to administer with 4 minutes allowed for writing each of the four stories. Scoring the TAT requires training, and this limits its usefulness with practitioners as a diagnostic tool. However, with training, tests can be scored in a highly reliable manner by different people. The test has shown moderate validity in its ability to predict achievement related behavior, but there have been problems with its reliability, and its use with women. Both problems tend to be related in part to the pictures that are used as stimuli. Since it is a projective test, pictures have to be used that represent achievement goals of men and women, and the same pictures will not always work with both sexes. By the same token, in test-retest studies, different pictures are used to prevent people from simply remembering and reporting the same stories twice. These difficulties are summarized by French and Lesser (1964). Persons who want to become proficient in in the use of the TAT should study the book by McClelland, et al.

(1953). It contains a group of stories for practice scoring, and the scoring results of experts to use for comparison.

References: French & Lesser, 1964; McClelland et al., 1953; Murray, 1938; Vidler, 1977.

Source: A set of pictures, response sheets, and scoring instructions for need for achievement, need for power, and need for affiliation are included in McClelland, D. C., & Steele, R. S., Motivation Workshops, 1972. General Learning Press, 250 James Street, Morristown, NJ 07960.

2. Test of Insight

Author: E. G. French

Description: This is a projective test that is similar to the Thematic Apperception Test (TAT), but uses a verbal stimulus instead of a picture. For example, the examinee is given a descriptive statement such as, "Bill is going back to the chemistry lab at the end of the school day," or "Richard always lets the other fellow win." After reading the statement, the examinee is instructed to write a short story describing the characteristics and motives of the character in the statement. The response is scored in the same manner as the TAT and requires considerable scorer training.

Reliability of the French Test is slightly better than the TAT, but it is still not as good as we would like. Its internal consistency has been estimated at .48, and test-retest correlations have ranged from almost zero (-.06) to .48. This measure has demonstrated better validity than the other

projective measures of need for achievement. Several studies have demonstrated that people who score high on this test also choose moderate risks in preference to high or low risk alternatives. This is consistent with achievement motivation theory. As with the TAT, care has to be taken in using this test with women. The verbal leads tend to represent male-oriented goals as traditionally defined in our culture. This sometimes results in responses from women that indicate a fear of success since succeeding at a male task could represent a threat to their femininity. Women who are seeking these traditionally male roles will evidence more achievement motivation on these tests, and other women will evidence more achievement motivation when traditional female roles are used. Readers interested in this issue are referred to Matina Horner (1974), who describes some results from the extensive work she has done on the topic.

References: French, 1955, 1958; French & Lesser, 1964; Horner, 1974.

Source: French, 1958.

3. Prestatie Motivatie Test

Author: H. J. M. Hermans

Description: Developed originally in Holland, this multiple-choice test has been used successfully in the United States. The test includes 29 items to measure the achievement motive and is generally used with college students and with children as young as nine years of age. With younger children, some items have to be revised (see Schultz & Pomerantz, 1974). The items

contain a stem which begins a statement, and from four to six response alternatives from which the examinee selects one. For example, "To prepare yourself a long time for an important task: (1) really is senseless, (2) often is rather rash, (3) can often be useful, (4) testifies to a sense of reality, (5) is necessary to succeed." This test has been found in several studies to have acceptable internal consistency and to correlate well with several other measures of achievement motivation. It has correlated positively with grades and other measures of achievement striving behavior in several validational studies, and may be used with males and females.

References: Hermans, 1970; Hermans et al., 1972; Schultz & Pomerantz, 1974.

Source: Swetz and Zentlinger, Keizersgracht 487, Amsterdam, Netherlands. Also, for a list of items used with ninth graders, write to Charles B. Schultz, Department of Education, Trinity College, Hartford, Connecticut 06106.

4. Achievement Motives Scale

Authors: T. Gjesme and R. Nygard

Description: This scale provides measures of the motive to achieve success and the motive to avoid failure. These scores may be combined into a single measure of resultant achievement motivation. It has been used with students from the ninth grade through college. The measure contains 30 items--15 for each subscale--which have four point, agree-disagree responses. Most of the items are very short. Samples of items designed

to measure success orientation are, "I like situations where I can test my abilities," and "I hope to be asked to do things which are somewhat difficult." Two of the failure orientation items are, "I worry about work I am not sure I can do," and "I become anxious when I meet a problem I don't understand immediately." Despite its brevity, the scale has demonstrated good reliability and validity. Internal consistency estimates on both subscales have ranged from .63 to .88 in the United States and Norway, and test-retest correlations of .65 and .71 were obtained over a six month interval. Validational studies have shown positive correlations with grades. These characteristics combined with the test's brevity suggest that this scale may find widespread application if additional normative data continue to be supportive.

References: Gjesme, 1974, 1975, 1977; Gjesme & Nygard, 1970; Nygard, 1977.

Source: Roald Nygard, Institute in Educational Research, University of Oslo, Box 1092, Blindern, Oslo 3, Norway, or, pending approval, from the first author of this monograph.

5. Resultant Achievement Motivation Test

Author: A. Mehrabian

Description: This is a short test that has been used with ninth graders through college-age students and adults. The full length test has 26 items and the shortened version has nine. The test consists of statements such as, "I worry more about getting a bad grade than I think about getting a good job,"

to which the examinee indicates agreement or disagreement on a four-point scale. This test includes subscales to measure both the motive toward success and the fear of failure which make it a measure of need for achievement. Despite the brevity of the test, particularly the short form, it shows relatively high internal consistency and stability. Estimates range from .55 to .76 for internal consistency and .71 to .78 for a 10-week test-retest correlation. The test may be used with males and females and has been shown to be significantly related to aspiration level and actual accomplishment, including grades (r = .48).

References: Fineman, 1977; Mehrabian, 1968, 1969; Schultz & Pomerantz, 1974.

Source: See Mehrabian, 1968, for address.

6. Sentence Completion Test

Author: B. N. Mukherjee

Description: This test has consistently good test-retest correlations, which indicate that it is a rather stable measure. The correlations have ranged from .71 to .83 with intervals ranging from 6 weeks to 3 months. It is a forced choice test which has been used primarily with college-age males and females. There are 50 items, and each item contains three statements. The examinee indicates which of the three statements is most characteristic and which statement is least characteristic. In addition to estimates of stability, the test has good internal consistency (.72). There is almost no information

on its relationship to other nAch measures, but it appears to be related to achievement-oriented outcomes. Some evidence suggests that people scoring high on this scale have higher personal aspirations, a stable self-image, and tend to be productive.

References: Clarke, D. E., 1973; Mukherjee, 1965, 1969.

Source: Mukherjee, B. N. Manual for sentence completion test. Preliminary Edition. Toronto: York University, 1969.

2. LOCUS OF CONTROL

2.1 What Is Locus of Control?

The concept of locus of control refers to a person's expectancy regarding the controlling influences on personal successes and failures. A person who tends to assume that good grades, friends, promotions, and other reinforcements are most likely to result from personal effort and initiative is an internally-oriented person. In contrast, an externally-oriented person tends to believe that irrespective of one's efforts, beneficial consequences are largely a matter of circumstance, either good luck or the favorable decision of a power-holding individual. The internal person who gets an A would be most likely to say, "Thanks to the effort I put into doing my best on that assignment, I got an A." The external would be more likely to say, "Wow, I really was lucky to have hit on a topic the teacher liked. It got me an A."

What is the value of the internal-external control construct? On the one hand, it seems to be a fundamental concern of mankind throughout the ages, and on the other hand it represents an important component of a contemporary approach to understanding human motivation. It is not difficult to find examples of a concern for the limits and meaningfulness of personal control in the writings of many scholars of the human condition. Epictatus (Kirk, 1956), one of the early Greek stoics who wrote during the period of social uncertainty that accompanied the disintegration of the powerful Greek citystates, begins the Enchiridion with the seemingly simple truism that "Of things some are in our power, and others are not." However, his entire treatise is a discourse on the relationship between the nature of reality and the problem of developing a realistic set of expectancies for personal control.

In contrast, Heraclitus (Wheelwright, 1964), a presocratic Greek philosopher representing more of an external orientation, focused more on the impermanence and whimsy of reality, and an inability to do anything about it. "You cannot," he pointed out in a familiar aphorism, "step twice into the same river, for other waters are continually flowing on." And in another fragment, "Time is a child moving counters in a game; the royal power is the child's" (p. 29). The extremely externally-oriented person views life as having many capricious and arbitrary consequences. These are but two of any number of examples that could be provided from almost any culture as illustrations of a universal concern for the limits of personal control in a world that severely taxes our efforts to peg it as being governed by law or caprice.

As a component of a psychological theory, Julian Rotter's conceptualization of locus of control is most well-known (Rotter, 1966, 1975). According to Rotter's social learning theory, locus of control is learned; that is, the actual pattern of reinforcements that we experience will influence the development of our locus of control orientation. A child who is consistently reinforced for personal accomplishment will be more likely to develop an internal locus of control than a child who receives reinforcements or punishments sporadically and inconsistently. However, once an individual's locus of control begins to develop, it begins to influence the person's behavior. People will differ in the extent to which they attribute outcomes to internal versus external sources of control even when the actual contingencies are identical.

Two highly moving and dramatic examples are provided by Arthur Koestler (1941) and Viktor Frankl (1963). In Darkness at Noon, Koestler portrays the effort of Rubashov, his central character, to maintain trust

in his own internalized sense of reality during a change in regimes and realignment of loyalties within the totalitarian government. Rubashov, while watching the antics of other bureaucrats as they tried to second-guess the appropriate postures to assume, had "the impression of a queer and ceremonious marionette-play with figures, moving on wires, each saying his set piece" (p. 117).

This same sense of unreality, and one man's effort to both understand and cope with it during a time of mortal danger, is described by Frankl in Man's Search for Meaning. He found that the survivors among those concentration camp prisoners who were not exterminated tended to be those who were able to maintain some sense of personal control over some aspects of their lives. Those who lived in hope of some external intervention, such as freedom by Christmas, tended to give up and die when their hopes were not met. In contrast, those who maintained more internal sense of control and concentrated on those tiny aspects of their environment that they could control, survived longer. Many aspects of this sense of personal control and its effects on performance, particularly in formal research studies, have been reviewed by Jones (1977).

It is difficult to change one's locus of control because the cognitive interpretation of events must be changed in conjunction with a carefully planned program of actual contingencies. Readers who are interested in readable but detailed presentations of this theory are referred to two articles by Rotter (1966, 1975) and two excellent recent texts (Lefcourt, 1976; Phares, 1976).

2.2 What Do We Know About Locus of Control?

Apart from its popular appeal, one of the reasons for the large number of studies utilizing the locus of control construct is probably its ease of measurement. There are a relatively large number of scales that have been prepared for all ages of children, young people, and adults. Most of them are freely available. The reader will notice similarities in many of the questions in the scales presented later in this section, but there are also some important differences. Some of the scales are designed to measure a person's generalized locus of control, while others are designed to measure it in a specific context. When specific measures are available, they are usually better for making predictions in that context.

Locus of control has been widely researched in several respects. One area of research is concerned with experimentally testing the assumptions and ramifications of the theory. Secondly, there have been a large number of correlational studies that have attempted to use locus of control as a predictor of everything from affiliativeness to zealousness. A third area focuses on the clinical understanding and use of the concept in personal counseling and behavioral change. There are also a fair number of studies of locus of control in relation to academic attitudes and performance. The following summary is restricted to findings on locus of control in relation to personal adjustment and academic outcomes.

1. A number of studies in different contexts have shown that internals exert more effort to master their environment. For example, Seeman and Evans (1962) studied patients in a tuberculosis hospital. They found

that internals were more inquisitive about tuberculosis and about their own condition, and they were less satisfied with the amount of information received from hospital personnel. Similar results have been obtained in reformatories (Seeman, 1963), schools (McGhee & Crandall, 1968), and different minority groups (Williams & Stack, 1972).

2. Internals are also more likely to exhibit greater self-control. They have been found to be less likely to smoke, more likely to quit smoking when given evidence as to its harmful consequences, and more likely to use family planning and birth control (e.g., Lundy, 1972). In a school context internals are more likely to exhibit self-control in response to failure. Loiacano (1978) found that internals tended to withdraw inwardly as a response to school failure, but externals tended to act out their frustration by misbehaving.

3. Externals tend to be more influenced by social pressures from the environment. They are more sensitive to subtle cues that indicate the desired response on the part of an experimenter or significant other person in the environment. The internal may choose to respond to deliberate efforts to influence but is most likely to resist subtle or indirect manipulations (e.g., Gore & Rotter, 1963).

4. Despite the greater efforts of internals to control themselves and their environments, there is no clear pattern of relationship between locus of control and academic performance (see reviews and arguments by Keller, Goldman & Sutter, 1978; Lefcourt, 1976; and Phares, 1976). In some cases internals have obtained better grades, or it has been shown

that locus of control interacts with particular teaching strategies to improve performance. However, just as often the expected results are not obtained. At this point the relationship between locus of control and achievement in highly specific contexts is clearer than it is in relation to general academic achievement. This may be due in part to the fact that there are many motives for getting good grades and that neither overall GPA nor final grade in a course is sensitive to locus of control differences as generally measured. It is encouraging that in more controlled studies that utilize more specific measures, stronger relationships are found (e.g., McGhee & Crandall, 1968).

5. There is reason to believe that locus of control is, in keeping with its general relationship to effective personal adjustment, related to personal attitudes toward school. This is in keeping with Weiner's interpretation of locus of control in the context of attribution theory (Weiner, 1974), and has been verified in several studies. Keller et al. (1978), for example, found that internals had a more positive accepting attitude toward teachers and toward education in general. Presumably, they are less likely to project their frustration onto teachers or the institution.

2.3 What Can Practitioners Do About Locus of Control?

There is considerable evidence in support of the conclusion that we can introduce positive shifts toward internality if it is desired. The issue at this point is whether internality is better than externality, and we run smack up against the traditional clinical problem of how to assign normative values to psychological states. Our understanding of

the concept of locus of control and the limits of our ability to measure it accurately in no way allow us to make the statement that internality is better than externality. What we can do is follow the traditional pattern of counselors and other clinical psychologists. We can suggest that when an individual or group of people have an impaired sense of personal competence that keeps them from coping effectively in their environment, our avenue to helping them is to provide experiences that will develop more of an internal orientation as part of the development of self-esteem and personal competence.

Given this need, there are several projects that provide examples for the practitioner who wishes to foster the development of personal competence without pressuring to take on the role or responsibility of the psychotherapist. The most extensive and well-documented effort of this type is the work of deCharms (1976). DeCharms conducted an elaborate well-funded project which paid teachers to participate in special training sessions to prepare for implementation of the program with the children. The project was similar to the achievement motivation workshop described earlier in this monograph, but focused on the development of personal competence rather than achievement motivation, per se. Participants learned to think in positive competent ways and to recognize success when it occurred, at the same time that they were reinforced for success. For example, many of these inner-city school children had unrealistically high goals, higher even than many of their counterparts in terms of age and ability in suburban schools. As a result of having such unattainable goals, they experienced no satisfaction in the actual accomplishment they achieved. The gains made by these children as a result of learning to think of themselves as the "origin" of their

thoughts and actions, rather than a "pawn," and of learning to set more realistic goals, were still evident to a significant degree in the longitudinal measurements taken by deCharms.

The cognitive element appears to be a highly important part of the behavioral change process. Dweck (1975) used a behavioral "success-only" approach with one group of children who had ability but who had an extremely helpless attitude toward mathematics. Their performance improved as long as they were able to be successful and were reinforced. But as soon as the problems became challenging, they gave up trying. With a second group Dweck introduced "reattribution therapy." These children were allowed to experience success on a number of problems, but they were deliberately over-challenged from time to time. Each time the experiments encouraged the child to keep trying, that success would result from additional effort. These children learned to attribute failure to lack of effort rather than lack of ability or external causes. However, one caution is in order for the practitioner who wants to bring about changes. Simply admonishing a child to try harder or stating that the child has the ability to do the work is not sufficient. The conditions surrounding the child have to be carefully managed so that the child will internalize the belief that she/he can do it. In other efforts to understand and change the learned helplessness syndrome in children, Keller (1979) and Murphy (1979) have designed and implemented similar approaches to the problem.

An excellent review of other efforts to deliberately influence locus of control is included in Lefcourt (1976). He refers to several clinical and correlational studies of interventions. One group that is particularly interesting illustrates that people develop more of a sense of effectiveness when they are allowed to serve as helpers or in other capacities of

responsibility that are not excessively challenging. The interested reader is referred to Harvey (1971) and Gottesfield and Dozier (1966).

2.4. Measures of Locus of Control

This section describes and critiques eleven measures of locus of control. The names of the measures and their appropriate age cohorts are summarized in Figure 2.

Title	Age group
Intellectual Achievement Responsibility Questionnaire (IAR)	Elem. - Jr. High
Children's Locus of Control Scale (Bialer's)	Elem. - Jr. High
Nowicki-Strickland Locus-of-Control Scale for Children	Grade 3 - College
Rotter's Internal-External (IE) Locus of Control Scale	High Sch. - Adult
Generalized Expectancy for Success Scale	High Sch. - Adult
Academic Achievement Accountability Scale	Grades 3 - 8
Gruen-Korte-Stephens Internal-External Scale	Elementary
Levenson Internal, Powerful Others, and Chance Scales	College - Adult
Locus of Control Interview	Presch. - Early Elem.
Reid-Ware Three Factor Internal-External Scale	High Sch. - Adult
Stanford Preschool Internal-External Scale	Preschool

Figure 2. Eleven measures of locus of control.

Intellectual Achievement Responsibility Questionnaire (IAR)

Authors: Virginia Crandall, Walter Katkovsky, and Vaughn Crandall

Description: The IAR was developed for use with children, and it is concerned with school achievement. The scale contains 34 items that ask the child why he passed a course of study, got a good grade, got special privileges, etc. Each item contains two choices. One indicates an external locus of control (e.g., the teacher likes me; the test was easy), or an internal orientation (I worked harder; studied a long time). Half of the items describe success situations and the other half failure situations. The two halves can be scored separately to compare the child's locus of control in response to failure and success. All of the items are combined for a total score which generally averages from 23 to 27, with most scores ranging between 19 and 30. The test predicts achievement at a significant, although modest, level (correlations range between .34 and .53). This is particularly important since more generalized measures do not show this reasonably consistent relationship.

Reference: Crandall et al., 1965; Lefcourt, 1976.

Source: Crandall, Katkovsky, & Crandall, 1965.

Children's Locus of Control Scale

Authors: Irving Bialer and Rue Cromwell

Description: One of the interesting characteristics of this scale is that it measures locus of control of standards in addition to reinforcement. The first variable is called locus of evaluation, and it refers to the extent to which a person establishes his own standards by which to judge his actions, or relies on an external

frame of reference. The other variable, locus of control, is slightly different in this scale as compared to most other scales. It refers to whether an individual believes he has control over the environment, as contrasted with having control over reinforcements. This difference is subtle, but could be important in some situations when deciding which scale to choose. In any case, this is a more generalized measure than, for example, the IAR. Sample items from this scale, which are answered yes or no, are: "Do you really believe a kid can be whatever he wants to be?" and, "Do you usually make up your mind about something without asking someone first?" The scale has 23 questions which may be administered in written form with groups through 14 years of age or read aloud with younger groups such as third graders. It has also been used with mentally retarded children with mental ages as young as 4 years and IQ's as low as 51. The test has good reliability estimates, both internal consistency and test-retest, and has been validated against achievement and other personality measures.

References: Bialer, 1961; Cromwell, 1963; Gozali & Bialer, 1968.

Source: Lefcourt, 1976.

Nowicki-Strickland Locus of Control Scale for Children

Authors: Stephen Nowicki, Jr. and Bonnie Strickland

Description: This scale covers a wide span of ages in that it has been used from grade 3 to college. It is a generalized measure of locus of control and covers interpersonal transactions ("Do you feel that most of the time parents listen to what their children have to say?"), bodily functions ("Do you believe you can stop yourself from catching

a cold?"), school ("Do you believe that if somebody studies hard enough he or she may pass any subject?"), and general philosophy ("Are some kids just born lucky?"). Each of the 40 items on the test is answered yes or no, with the external responses being added for the total score. There is a short form of the test for use with grades 3 through 6 and another for use with grades 7 through 12. Reliability estimates are adequate, and the test correlates appropriately with several other measures of locus of control, thus indicating its validity as a measure of this construct. Scores obtained from grades 3 through 12 show a shift toward internality from a mean score of 18 to 11. This is consistent with the theoretical expectation that children will develop more of an internal orientation as they do, in fact, develop more ability to exert control on their environment.

Reference: Nowicki & Strickland, 1973.

Source: Nowicki & Strickland, 1973.

Internal-External Locus of Control Scale (IB)

Author: Julian Rotter

Description: Rotter's scale has undoubtedly had a major impact in this area of research. It is used primarily with college-age students and adults, but it has also been used with high school students. It is a measure of a generalized expectancy for success, as contrasted with content-specific measures such as IAR. It has been used in many research studies in a wide variety of settings ranging from prison to schools, and for a broad range of purposes including psychotherapy and prediction of academic success. The scale contains

29 items of which six are "fillers," or jokes, aimed at disguising the primary purpose of the test. All items are forced choice; two statements are presented and the respondent is required to pick the most agreeable one. Each alternative is keyed as an external or internal choice, and the external choices on the 23 valid items are added together. Therefore, scores can range from 0 to 23 with higher scores representing more of an external point of view. The average scores for college students now tend to be between 10 and 12, being slightly more external than they were a decade ago. Extensive norms for various reference groups have been collated by Lefcourt (1976).

References: Keller & Pugh, 1976; Keller, et al., 1978; Lefcourt, 1976; Phares, 1976; Rotter, 1966, 1975.

Source: Lefcourt, 1976; Phares, 1976; Rotter, 1966.

Generalized Expectancy for Success Scale

Authors: Bobbi Fibel and Daniel Hale

Description: This recently developed scale seems to provide a generalized measure of optimism and competency. The initial work in developing and validating the scale was done with college students, but the content of the items is such that it could be used with high school, and perhaps with junior high. With slight revision to clarify the meaning of some words (e.g., "marital"), it could probably be used with even younger children. The test begins with a stem that is common to all of the 30 items: "In the future I expect that I will:" Several of the specific items are: "be a good parent," "be unable to accomplish my goals," "get the promotion I deserve," "be listened

to when I speak," and "succeed at most things I try." Each item has a five-point scale with 5 = highly probable and 1 = highly improbable. The responses for each item are totaled, after reversing negatively stated items, which means that the scores can range from 30 to 150. The average score for college males and females was 112. In the initial tests, the scale demonstrated high internal consistency and test-retest correlation. With respect to validity, it is negatively correlated with several measures of depression, which is logical since depression is most often defined as feelings of ineffectualness.

Reference: Fibel & Hale, 1978.

Source: Fibel & Hale, 1978.

Additional Measures

A large number of locus of control scales have been constructed for a variety of purposes. The five preceeding scales represent those that have been used most extensively and are relatively easy to obtain. Following are brief descriptions of six additional scales which have had less use to date or were developed for a specific purpose. However, they might be of value to a practitioner in a particular context.

1. Title: Academic Achievement Accountability (AAA) Scale

   Description: For use with grades 3 to 8, this scale contains 18 Likert-like items with responses ranging from a "strong yes" to a "strong no." It measures locus of control.

   Reference: Clifford & Cleary, 1972.

Source: Margaret M. Clifford, Department of Educational Psychology, University of Iowa, Iowa City, Iowa 52242; and reproduced in Johnson & Bonmarito, 1976.

2. Title: Gruen-Korte-Stephens Internal-External (IE) Scale

Description: This is a forced choice scale with 38 items measuring academic locus of control in elementary school children. Each item is on a separate page and is illustrated pictorially.

Reference: Gruen, Korte & Baum, 1974.

Source: Gerald E. Gruen, Department of Psychological Sciences, Purdue University, West Lafayette, Indiana 47907.

3. Title: Levenson Internal, Powerful Others, and Chance Scales

Description: This scale, containing 24 items and used with college students and adults, contains separate measures of internal control, externality due to powerful others, and externality due to chance.

Reference: Prociuk & Breen, 1974.

Source: Terry J. Prociuk or Lawrence J. Breen, Department of Psychology, University of Manitoba, Winnepeg, Manitoba, Canada R3T 2N2.

4. Title: Locus-of-Control Interview (LCI)

Description: This exploratory interview contains 25 items and follows the patterns established by Piaget. It is for use with young children of preschool and early school age, particularly those with limited verbal ability.

Reference: Shore, Milgram & Malasky, 1971.

Source: Mental Health Study Center, 2340 University Boulevard East, Adelphi, Maryland 20783.

5. Title: The Reid-Ware Three Factor Internal-External Scale

Description: This is a 45-item, forced-choice scale which separately measures internality (self-control), powerful others (social systems control), and chance (fatalism). Each item contains three statements representing the three factors, and one must be chosen. It is for use with high school through adult populations.

Reference: Reid & Ware, 1974.

Source: Lefcourt, 1976.

6. Title: Stanford Preschool Internal-External Scale

Description: Dealing with common childhood preschool experiences, this 14-item forced choice scale measures I-E in relation to positive and negative events similarly to the IAR. There are two parallel forms of this test.

Reference: Mischel, Zeiss, & Zeiss, 1974.

Source: Lefcourt, 1976.

3. CURIOSITY AND AROUSAL-SEEKING

3.1 What Is Curiosity?

While everyone understands intuitively what it means to be curious, we need a somewhat rigorous definition of the term if we are to measure it and use what we know about curiosity to improve instruction. Unfortunately, no single definition prevails in the research literature. One widely quoted definition is that developed by Maw and Maw (1964), who reviewed dictionary definitions and scientific and literary writings to arrive at the following:

Curiosity is demonstrated by an elementary school child when he:

1. reacts positively to new, strange, incongruous, or mysterious elements in his environment by moving toward them, by exploring them, or by manipulating them.
2. exhibits a need or a desire to know more about himself and/or his environment.
3. scans his surroundings seeking new experiences.
4. persists in examining and exploring stimuli in order to know more about them.

This definition has the advantage of staying close to observable behavior; it suggests methods of measuring curiosity. It also makes it clear that the word curiosity covers a multitude of behaviors, so that there are a number of distinct aspects to the concept. One distinction can be seen in parts 1 and 3 as compared to part 2 of this definition. The former emphasizes the use of the senses in exploratory behavior; the latter emphasizes the use of the intellect. This difference between a desire to sense and a desire to know is clarified by use of the terms perceptual and epistemic curiosity. Of the two, epistemic (knowledge-seeking) curiosity is the more important in education.

Another useful distinction to be made is that between state and trait curiosity. At any given moment, if a person exhibits any or all of the behaviors in the Maws' definition, we can say that the person is in a state of curiosity. If a person has a general tendency or predisposition to exhibit these behaviors often, she/he can be said to be curious as a trait. Even the most curious person can be bored and uninterested in certain situations; even the most incurious person can be turned on if conditions are right. It's important for educational practitioners to be clear about the state-trait distinction because it leads to differing prescriptions for the conduct of instruction.

During the normal course of a day, each of us varies in his/her level of arousal or activation. It is low while we sleep, and during our waking hours it rises and falls as we move through various situations. The idea of an optimal level of arousal is a vital concept which underlies most of the theoretical work being done on curiosity. When we are below our preferred level, boredom sets in, and we work to raise our arousal outwardly by moving into a more stimulating setting, or inwardly by daydreaming or thinking. When the environment is over-stimulating, we try to reduce our level by moving to a calmer place, by ignoring part of our surroundings, or by actively trying to perceive and understand the environment and thus diminish its arousing properties.

Curiosity and the arousal-seeking tendency are two separate personality variables which are related by the optimal arousal level model. Measures of curiosity try to gauge a person's tendency to seek out over-stimulating situations and learn from them. Measures of arousal-seeking, on the other hand, focus mostly on the arousal-raising half of the model. They measure an individual's need for change and variety and the tendency

to avoid boredom by any means. Although curiosity is more closely related to learning than arousal-seeking is, both concepts have practical utility in education.

3.2 What Do We Know About Curiosity?

Measures of curiosity and arousal-seeking tendency are generally not as well developed as we would like, and research based on such measures is on shakier ground than work in some other areas of educational research. Nonetheless, some consistent (or at least credible) trends appear in the literature:

1. Children who are high in trait curiosity come from home environments that are structured and orderly (but not rigid), and inhabited by adults who serve as models of effectivenss and curiosity. Curiosity is nurtured by parents who provide their children with warmth, attention, and independence.
2. There is a low positive relationship between curiosity and intelligence. Curiosity and school achievement are also positively linked.
3. Creativity and curiosity are closely related. Curious children score higher on measures of divergent thinking and inventiveness.
4. Many studies find a negative relationship between curiosity and anxiety.
5. In a large study of fifth graders (Maw & Maw, 1965), curious children were rated highly by their peers on dimensions of effectiveness, loyalty, reliability, and accountability.

They were also seen as more intelligent and creative, better socialized, more secure, and more tolerant of socially ambiguous situations.

6. In another of the Maws' studies (1964), curious children were found to ask more and better questions, select more adventurous activities, have more general information about the world, recall more specific facts, relate more often to the unfamiliar, and persist longer at problem-solving.

7. State curiosity can be aroused by novelty, ambiguity, complexity, paradox, or incongruity in the environment.

8. State epistemic curiosity is most highly aroused by things that are moderately familiar, i.e., at the middle ground between totally known and totally unknown.

9. Sensation-seeking or arousal-seeking among adults is related to recreational drug use, sexual experimentation, and volunteering for psychological experiments involving sensory deprivation, hypnosis, or drugs.

10. There is some evidence that high arousal-seekers are born and not made. Studies comparing identical and fraternal twins indicate that the arousal-seeking tendency is largely inherited.

11. Although there is a low positive correlation between sensation-seeking and intelligence, there is no parallel relationship with achievement in school. It seems that the typical school environment does not provide the type or amount of stimulation that high sensation-seekers need, so they put their energies elsewhere.

For a more detailed review of the curiosity literature, see Maw & Maw (1964), Vidler (1977) and Berlyne (1965). Zuckerman (1978) provides a brief and interesting overview of his sensation-seeking research.

3.3 What Can the Practitioner Do About Curiosity?

It is not always possible or practical to individualize instruction to accommodate the cognitive and personality characteristics of learners. However, even when instruction is to be delivered in only one way, as in a lecture, it is possible to use some of the findings of curiosity research to improve instruction. Ordinary classroom procedures result in too low a level of arousal much more often than too high a level; it's a lot easier to bore learners than to over-excite them. This being the case, most instruction would benefit by the application of some of Berlyne's theoretical notions. Put in its most basic form, Berlyne's theory suggests that novelty, surprise, complexity, ambiguity, and uncertainty arouse curiosity in learners, so that teachers and instructional designers would do well to consciously build these elements into a presentation whenever possible. It is important that the information needed to relieve curiosity also be made available, lest the result be frustration rather than pleasure.

When instruction is individualized, information about learner curiosity can be used in several ways. Learners who have been identified as being high in curiosity can be provided with more information, and the freedom to pursue their interests as far as they can. The high curiosity student might especially benefit from prepared bibliographies and lists of additional readings and resources. For learners who are low in trait curiosity, it might be appropriate to introduce novelty,

incongruity, and surprise whenever possible, and to use examples and analogies that match the learner's interests.

Learners who are high in arousal-seeking tendency need more change and intensity than is found in most classrooms. They might thrive in learning projects that require them to gather information from a lot of sources, and perform many different activities. Field trips, fast-paced media presentations, and simulation/games could also be beneficial.

Finally, the measure of state curiosity described below could be a very useful tool. We can rarely teach all there is to know about a given topic in the time we have available. In many cases it would be desirable for learners to leave the instructional setting still curious about what they have learned, so that they will continue to learn more about the topic on their own. When continuing curiosity is an important objective, a measure of state curiosity can be used in the formative evaluation of instruction. If the instructional material or presentation fails to arouse state curiosity, revision is called for.

Curiosity can be a powerful force in education. The following measures can help you make more effective use of it.

3.4 Measures of Curiosity and Arousal-Seeking

The titles of ten measures of curiosity and arousal-seeking and their appropriate age groups are listed in Figure 3. They are discussed in the following pages.

Curiosity	Age Level
Curiosity Adjective Checklist	Kindergarten - Grade 2
Cognitive Orientation Questionnaire of Curiosity	4 - 8 years
Student Behavior Profile	Grade 1 - Grade 3
Maws' About Myself Scale	Grade 4 - Grade 6
Pre-, Post-, Retest Technique	Middle School to Adult
State Curiosity Scale	High School to Adult
Scale of Academic Curiosity	High School & College
Arousal-Seeking	
Children's Stimulus Seeking Scale	Grade 4 - Grade 6
Arousing Seeking Tendency Scale	High School - Adult
Sensation Seeking Scale	Adults

Figure 3. Ten measures of curiosity and arousal-seeking.

1. Curiosity Adjective Checklist

Authors: Robert Hogan and Ellen Greenberger

Description: This is a rating scale for use by teachers to rate children from kindergarten to second grade. The checklist consists of 40 adjectives which the teacher checks off if they describe the child. Twenty of the adjectives indicate the presence of curiosity (e.g., active, adventurous, curious, enthusiastic), 10 reflect qualities antithetical to curiosity (apathetic, dull, fearful, meek), and 10 are social desirability

adjectives used as a check on rater bias. This list has a split-half reliability of .90 and was found to relate significantly with another curiosity measure (Student Behavior Profile), and with the children's preference for incongruous pictures. When used by one teacher, the checklist can give rank order data on curiosity within one classroom. If several raters observe each child and the ratings are averaged, the checklist provides a better estimate of the child's curiosity.

Reference: Hogan & Greenberger, 1969.

Source: Hogan & Greenberger, 1969.

2. Cognitive Orientation Questionnaire of Curiosity (COQC)

Authors: Shulamith and Hans Kreitler

Description: This is a measure of norms, goals, and beliefs about curiosity. Designed for use with children from 4 to 8 years old, there are separate forms for boys and girls. The measure is given orally and consists of descriptions of situations and questions about those situations. Children's answers are scored as being pro-curiosity, anti-curiosity, or indeterminate. Four scores are calculated (norms, general beliefs, beliefs about self, and goals), and these determine a profile and a cognitive orientation score. The COQC subscales have reliabilities between .79 and .93 and have shown a test-retest reliability of .91. There is also substantial validational evidence as the cognitive orientation score was a successful predictor of 20 different behaviors which reflected curiosity.

References: Kreitler & Kreitler, 1976; Kreitler, Kreitler, and Zigler, 1974.

Source: Shulamith Kreitler, Department of Psychology, Tel Aviv University, Ramat Aviv, Tel Aviv, Israel.

3. Student Behavior Profile (SBP)

Author: Ellen Greenberger

Description: The SBP is a rating scale for use by teachers with children in the first, second, and third grades. It has 35 items, of which 14 are directed at curiosity, 13 at achievement motivation, and 8 are fillers. Teachers rate the children along a 9-point scale with bi-polar statements at each end (e.g., "Interested in people different from himself," "Not interested in people different from himself"). The internal consistency of the curiosity scale was .93, but there is no data on inter-rater reliability. Support for the profile's validity comes from a high correlation with an adjective checklist of curiosity. There was also a fairly strong correlation with grades which may mean either that curiosity was welcomed and rewarded by the teachers studied, or that teacher ratings of curiosity were contaminated by their perception of the children's ability.

Reference: Greenberger, 1969.

Source: Greenberger, 1969.

4. Maws' About Myself Scale

Authors: W. H. Maw and E. W. Maw

Description: The About Myself Scale is a self-report questionnaire suitable for children in grades four through six. It is one of the more successful measures developed in a large exploratory study (Maw & Maw, 1964). The 41 items describe different behaviors related to curiosity to which children respond "never," "sometimes," "often," or "always." Sample items include: "I like to explore strange places," "I question things that I read or see," "I keep my hands clean," "I like to find out how things work." There are different response weightings for different items, so hand scoring is likely to be tedious. The measure has a reported split-half reliability of .91 and was able to discriminate between high and low curiosity groups with an accuracy significant at the .005 level.

Reference: Maw & Maw, 1968.

Source: Maw & Maw, 1968.

5. Pre-, Post-, Re-test Technique

Authors: E. B. Little and J. W. Creaser

Description: This is a measurement technique rather than a specific instrument. In an introductory biology course, Little and Creaser gave a multiple choice test containing recognition-type items on the first day of class. The same items were scattered through the course final exam. A year later, students were retested on the same items. The assumption was that if a

student got an item wrong on the first two tests, but got it right a year later, then curiosity was at work. A curiosity score derived this way was shown to be related to achievement in math, science and vocabulary, as are other curiosity measures. Use of this technique requires some caution, and the authors describe how they controlled for biases not due to curiosity. This method has the advantage of being easily introduced into a school setting without students feeling that they are experimental subjects. Disadvantages are the time delay between pretest and retest and the lack of certainty about the technique's validity.

Reference: Little & Creaser, 1968.

Source: Little & Creaser, 1968.

6. State Curiosity Scale

Author: Barbara L. Leherissey

Description: This seems to be the only pencil and paper measure of state curiosity available. It is appropriate for people of high school age and older and consists of 20 items such as the following: "The material I learned was very interesting to me," "I would enjoy reading more about this subject material," "I would like to see some of the points in the material expanded." Responses to each item go from "not at all" to "very much so" in four steps. This measure is used to determine how much curiosity was aroused by some instructional materials. It was developed for use with computer aided instruction but should

be applicable to any medium of instruction. Its reliability is reportedly in the high eighties, and there is some support for its validity.

Reference: Leherissey, 1971.

Source: Leherissey, 1971.

7. Scale of Academic Curiosity

Authors: Derek C. Vidler and V. E. Karan

Description: As the title indicates, this measure is especially relevant to educational settings. It is made up of 80 true-false items such as "I like to look up new words in the dictionary," "When I hear about a new subject I like to find out more about it," "I read little outside school unless I have to." The test can be used with students from grade 8 to adults. The split-half reliability in one study was .87, and the scale has been shown to be related to measures of reading ability and creativity. It has a low positive correlation with GPA. A recent study (Vidler & Rawan, 1975) found five weak factors in the instrument, suggesting that the scale is measuring more than one construct. The authors are working on refinements of the measure, but even in its present form it appears useful.

References: Vidler & Rawan, 1974, 1975; Vidler & Karan, 1975.

Source: Derek C. Vidler, Box 1661, Hunter College, CUNY, New York, NY 10021.

8. Children's Stimulus Seeking Scale

Authors: R. A. Hicks, S. L. Decker, and J. C. Stagnaro

Description: This is a measure of willingness to seek stimulation, or what Berlyne terms diversive curiosity. Geared to children in grades 4, 5, and 6, it contains 39 true-false items like the following: "I like to go exploring," "I like to ride my bike with no hands," "I get embarrassed when people sing Happy Birthday to me." It has a test-retest reliability over six weeks of .83 and was found to correlate significantly with teacher ratings of stimulus seeking and with a novelty preference task. It is scored by adding up the number of stimulus seeking responses, so scores range from 0 to 39.

Reference: Hicks & Dockstader, 1968.

Source: Dr. Robert A. Hicks, Psychology Department, San Jose State University, San Jose, CA 95192.

9. Arousal Seeking Tendency Scale

Authors: A. Mehrabian and J. A. Russell

Description: Like the Sensation Seeking Scale, this measure is related to diversive curiosity, i.e., the tendency to seek out novelty or strongly sensual experiences and thereby avoid boredom. There are 40 items in the instrument, with responses ranging across a 9-point agree-disagree scale. The items fall into five different factors:

1) Arousal from change. Sample item: "I like to go somewhere different nearly every day."

2) Arousal from unusual stimuli: "Designs or patterns should be bold and exciting."

3) Arousal from risk: "I sometimes like to do things that are a little frightening."

4) Arousal from sensuality: "I like to run through heaps of fallen leaves."

5) Arousal from new environments: "I would be content to live in the same town for the rest of my life."

The Arousal Seeking Tendency Scale is appropriate for use with people of high school age and older. It has been found to have a split-half reliability of .90 and a test-retest reliability of .88, thus showing internal consistency and stability over time. The scale has been found to be positively related to extraversion, affiliative tendency, and trait arousal, and negatively related to measures of anxiety and neuroticism.

References: Mehrabian & Russell, 1973, 1974; Mehrabian, 1977.

Source: The measure appears in Appendix C of Mehrabian & Russell, 1974.

10. Sensation Seeking Scale (SSS)

Author: Marvin Zuckerman

Description: The first version of the SSS contained 34 items and was developed in 1964. A second version (Form IV) which appeared in 1971 had been expanded to 72 items. The instrument is used with adults and requires that one choose between pairs of sentences (e.g., A. I prefer friends who are excitingly unpredictable; B. I prefer friends who are reliable and

predictable). The instrument gives a general SS score as well as scores on four factors: Thrill and Adventure Seeking, Experience Seeking, Disinhibition, and Boredom Susceptibility. It has scale reliabilities in the seventies and eighties, and SSS scores are correlated with measures of need for change, thrill seeking, achievement motivation, and attitude toward psychedelic drugs. A few of the items already seem dated. (For example, "I like to see men wearing beards," "I would like to make friends in some of the 'far out' groups like artists and hippies.") An advantage of this instrument is the large number of studies that have been conducted with it. Norms are available in the manual.

References: Zuckerman, Kolin, Price & Zoob, 1964; Zuckerman, 1971, 1978; Blankstein, Dante & Donaldson, 1976.

Source: The earlier version can be found in its entirety in Zuckerman et al., 1964. The sensation seeking choices of the second version, but not the alternatives, are listed in Zuckerman, 1971. For a complete description of Form IV, write for the Manual and research report for the Sensation Seeking Scale (SSS) (1975), Department of Psychology, University of Delaware, Newark, Delaware 19711. The manual is also available in microfiche in the ETS test collection as No. 007004.

4. ANXIETY

4.1 What Is Anxiety?

Anxiety can take many forms: trembling, a nervous feeling in the pit of the stomach, sweating, feelings of apprehension, and avoidance of certain situations. These are easily recognized as aspects of anxiety, however, when we try to describe anxiety in more abstract terms there is disagreement on what the definition should include and where the borderlines between fear, stress, and anxiety should be drawn. For purposes of discussion in this chapter, we shall define anxiety simply as an unpleasant feeling resulting from a perceived threat in the environment.

One source of problems in defining and understanding anxiety is that the concept is almost too large to be useful. When we use the word loosely, we invite confusion and vagueness, and we get no closer to being able to do anything for the anxious learner. There are, however, several dimensions along which the idea of anxiety can be broken down into more manageable pieces. These dimensions might be expressed as questions: How durable is anxiety? How generalized is it? Does it help or hinder performance?

The question of how durable anxiety is once again suggests the difference between traits and states. A trait is a lasting characteristic of an individual; a state is a temporary condition. People who possess high trait anxiety are more likely to become anxious in stressful situations than those who are low in trait anxiety. In other words, they are more likely to experience state anxiety, a temporary fluctuation in

anxiety level. Anyone can experience state anxiety in a given situation regardless of how anxious the individual is in general.

How generalized is a person's anxiety? This is another useful dimension for making distinctions. Some people become anxious in a wide range of different situations: they worry about their health, about failing, about having to speak to a large group, about having an accident, and about stepping on snakes. Others are relaxed about almost everything but become extremely nervous in a particular setting, such as dating or doing mathematics. We should be careful to distinguish between generalized anxiety and situation-specific anxiety. Notice the difference between this dimension and the one discussed in the previous paragraph: states and traits have more to do with the person; generality and specificity relate to the environment.

Finally, we can ask whether anxiety is helpful or hurtful. Most of the research on anxiety has implicitly assumed that performance always deteriorates when anxiety is high. Alpert and Haber (1960), however, wanted to be able to distinguish between people who are aided by stress, and those who aren't. This led them to develop the Achievement Anxiety Test, which is unlike other measures because it makes this distinction. Many people work best under the pressure of deadlines or testing situations; for them, the anxiety felt is facilitating. Many other people do not do well in such situations, and for them the effect is debilitating.

4.2 What Do We Know About Anxiety?

Research on anxiety in school settings has been widely carried out and reported, particularly since the early 1950's when pencil and paper measures of anxiety became available and schools began to feel the effects

of the postwar baby boom. Social scientists rarely state their findings as certainties because alternative explanations lurk within every study conducted. The statements below represent some generalizations that have received a fair degree of support, but should be taken with a small to medium-sized grain of salt. Unless otherwise specified, the anxiety referred to is generalized trait anxiety.

1. There is a negative relationship between anxiety and self-esteem in children. High anxiety (HA) children see themselves as less able and less adventurous than do children low in anxiety.
2. HA children are less curious, and HA adults score lower on measures of sensation-seeking.
3. Children high in anxiety daydream more often. Perhaps because they see more things in the environment as threatening, they tend to retreat inward where things are more under their control and where success experiences can be imagined.
4. Just as HA children have low opinions of themselves, so do their classmates. A number of studies have found HA children to be less popular and more isolated from their peers.
5. Classroom observations suggest a relationship between test anxiety and certain behaviors, at least for boys. HA boys in one study were characterized as hiding their emotions, having difficulty in communication, and noted for submissiveness, caution, lack of ambition, underachievement, underactivity, lack of attention, and lack of responsibility.
6. Interviews with parents indicate that fathers of HA children view them as less mature and relaxed, and more dependent.

Mothers of the same children did not see them as any different from low anxiety children, but there is some evidence that the mothers in the study weren't being totally candid with the interviewers or with themselves.

7. There is a low negative relation between IQ and both general and test anxiety among children. Some, and possibly all, of this relationship may be due to the debilitating effect of anxiety during the intelligence test-taking situation.

8. Measures of anxiety are negatively related to school performance as indicated by grade point average. Specific measures of anxiety in academic settings are much better predictors of grades than general measures of anxiety.

9. There is a complex relationship between anxiety and learning. Although the majority of the evidence points to a negative relationship between anxiety and performance, there are times when anxiety can aid in learning. This is particularly true for simple tasks like memorizing multiplication tables or catechism questions. For higher-order tasks like writing poetry or working a geometry problem, a state of anxiety is likely to limit performance.

For more details on these and other findings, the reader is directed to excellent reviews by Hansen (1977), Gaudry and Spielberger (1971), and Spielberger et al. (1972).

4.3. What Can The Practitioner Do About Anxiety?

There are at least three broad approaches that might be taken in cases where anxiety seems to be getting in the way of learning:

1) Lower the anxiety level of the individual.

2) Decrease the effects of anxiety on learning by teaching compensatory skills.

3) Restructure the environment to be less threatening.

Lowering anxiety in many cases no longer requires years of psychotherapy. There are proven techniques based on behavioristic principles which are becoming more and more widely available. One of these is systematic desensitization. A basic assumption underlying the technique is that you can't be relaxed and anxious at the same time, so the first order of business is to teach people to relax. This takes several sessions and involves progressive muscle relaxation and guided imagery. Once students have learned to become relaxed at will, they are directed to visualize an event or scene that is slightly anxiety-provoking to them. If this causes some anxiety, they counter it with relaxation techniques until they can picture the event without becoming nervous. Then they do the same thing again for something that is slightly more anxiety-provoking. They continue this process all the way to the top of an anxiety hierarchy, until they can remain relaxed while imagining what used to be their worst fear.

There are many variations of this basic technique. Edie (1971) describes a procedure called Anxiety Management Training which has been shown effective in treating generalized anxiety. Morin (1972) provides a very readable account of a group desensitization program used with college students. School psychologists and university counseling centers can provide such services, and teachers and other practitioners should be aware of their existence.

A second approach is not to treat the anxiety directly but to provide the student with skills to minimize the effect of anxiety on learning and school performance. Sieber (1969) proposed that high anxiety debilitates memory and that this is one of the principle causes of poor performance on tests. To compensate for this effect, teachers and designers can provide mnenonics, outlines, diagrams, and other forms of memory support, and can teach students how to create these supports for themselves.

Restructuring the environment to be less threatening is the approach that is closest to the domain of the instructional designer. What is threatening about a learning situation? It provides the opportunity to fail, and highly anxious learners take this as a threat to their self-esteem. An appropriate learning environment for the HA learner would minimize the number of failure experiences, maximize success and feelings of mastery, diminish time pressures, and allow errors--when they do occur--to be private rather than public.

Programmed instruction (PI) and computer-aided instruction (CAI) have been suggested as media which fit this description. The student can move at his or her own pace; errors are known only to the student and are corrected immediately, and emphasis is on reaching mastery in gradual steps. Several studies conducted with both PI and CAI have found them effective in cancelling out the effects of anxiety on learning. Other teaching techniques which approximate a non-threatening environment should also be effective and should be tried.

What can a practitioner do with measures of anxiety? Some uses have already been suggested. Once highly anxious students have been identified, they can be referred to counseling, given memory supports,

or placed in as non-threatening a learning environment as is practically possible. Some of the measures to be described below suggest other specific uses. The A-State scale of the State-Trait Anxiety Inventory, for example, could be used by a teacher in an ordinary classroom setting to get a feel for which behaviors and techniques raise or lower state anxiety. Instructional designers could also use the scale during the process of formative evaluation to insure that learning materials are not anxiety-producing. Educational evaluators might use the A-State scale for both formative and summative evaluation of instructional materials, methods, and programs.

Subscales on the School Anxiety Questionnaire could be used by the elementary or high school teacher to identify specific aspects of schooling which are stressful to the individuals; that information could be used in counseling the student or to alter the student's environment. Specific measures like the scales on math, writing, or teaching anxiety can also be used in this manner.

The scales described below have been chosen because they have adequate reliability and validity, and they are easy to administer and score. The creative practitioner can think of many other ways to use them to improve learning.

4.4 Measures of Anxiety

Nine measures of anxiety are now reviewed. The names of the scales and their appropriate age cohorts are summarized in Figure 4.

General measures of anxiety	Age level
General Anxiety Scale for Children	Grades 1 to 9
State-Trait Anxiety Inventory	High - College
Taylor Manifest Anxiety Scale	High - College
General academic anxiety measures	
Test Anxiety Scale for Children	Grades 1 to 9
School Anxiety Questionnaire	Grades 4 to 12
Achievement Anxiety Test	College
Specific academic anxiety measures	
Writing Apprehension Measure	High - College
Mathematics Anxiety Rating Scale	College
Teaching Anxiety Scale	Preservice & inservice teachers

Figure 4. Nine measures of anxiety.

1. General Anxiety Scale for Children (GASC)

Authors: Seymour Sarason et al.

Description: As indicated by the title, this is a measure of anxiety as experienced in a broad range of settings. It is designed for use with children from grades 1 to 9 and is given orally, usually in conjunction with the Test Anxiety Scale for Children. The GASC contains 45 items of which 11 are used to determine how honestly the child is responding. Among the 34 anxiety items are: "Are you afraid of things like snakes?"

"When you are away from home, do you worry about what might be happening at home?" "Do you worry that you might get hurt in an accident?" Children respond to these questions with a yes or no. There are some indications that the GASC has lower reliability for very young school children, but its validity is supported by low negative relations between the GASC and measures of IQ and achievement and by positive correlations with the Test Anxiety Scale for Children. It has been found that girls score higher than boys on both the GASC and the TASC, particularly the former.

Reference: Sarason et al., 1960.

Source: Sarason et al., 1960.

2. State-Trait Anxiety Inventory (STAI)

Authors: Charles D. Spielberger, R. L. Gorsuch, and R. E. Lushene

Description: The State-Trait Anxiety Inventory is regarded as one of the most carefully developed instruments available for measuring anxiety. Spielberger has been a leading proponent of the need for distinguishing between state and trait anxiety, and the STAI gives separate scores for each. The A-State scale consists of 20 items which ask the subjects how they feel at a particular moment in time. Typical items are: "I feel calm," "I am tense," and "I feel over-excited and rattled." Responses are made on a 4-point scale with these categories: "not at all," "somewhat," "moderately so," "very much so." The A-Trait scale also consists of 20 items which, in contrast, ask people how they generally feel. Sample items are: "I feel pleasant,"

"I become tense and upset when I think about my present concerns," and "I am a steady person." Response options are: "almost never," "sometimes," "often," and "almost always." An advantage of the STAI is that the A-State scale can be given several times to measure fluctuations in anxiety caused by different situations. The STAI is reliable and has a great deal of validational support. It has proven useful in such varied settings as athletic competitions (Klavora, 1975) and computer-assisted instruction (O'Neil et al., 1969).

References: Klavora, 1975; O'Neil, Spielberger, & Hansen, 1969.

Source: Spielberger, Gorsuch, & Lushene, 1970.

3. Taylor Manifest Anxiety Scale (MAS)

Author: Janet Taylor

Description: This is one of the earliest and most durable measures developed for the study of anxiety. Based on Spence's drive theory, it is built around 50 true-false items taken from the Minnesota Multiphasic Personality Inventory. The MAS is a measure of trait anxiety, as can be seen in the wording of the items which include such phrases as "often," "usually," and "hardly ever." People are asked to indicate a general tendency to experience anxiety rather than feelings of anxiety at a particular time. The MAS is internally consistent and has a fairly high test-retest stability over time, as shown by a reliability of .81 over a period of 9 to 17 months. One test of its validity found, as expected, that a group of psychiatric patients had a much higher anxiety score than a group of

normal subjects. Researchers using the MAS have found that those scoring low in anxiety perform better at complex learning tasks than high anxiety subjects, while the reverse is true for simple tasks.

Reference: Taylor, 1953.

Source: Taylor, 1953.

4. Test Anxiety Scale for Children (TASC)

Authors: Seymour Sarason et al.

Description: The TASC was developed for use with children from the first grade to the ninth. It consists of 30 items which are read to the children, who respond by circling either "yes" or "no." Three of the items are: "Do you sometimes dream at night that other boys and girls in your class can do things that you cannot do?" "When you are taking a test, does the hand you write with shake a little?" "While you are on your way to school, do you sometimes worry that the teacher may give the class a test?" The validity of the TASC has received support from a variety of studies. One cross-cultural study compared British and American children on both general anxiety and test anxiety. Because of the British emphasis on testing and streaming children by ability, it was expected that British children would be higher on text anxiety than their American counterparts. This proved to be the case, although there was no significant difference in general anxiety between the two groups. Like other test anxiety measures, the TASC is negatively related to school grades. In practice, it has proven to be a better predictor of grades for boys than for girls.

Reference: Sarason et al., 1960.

Source: Sarason et al., 1960.

5. School Anxiety Questionnaire (SAQ)

Authors: James A. Dunn and John R. Bergan

Description: This measure can be used with children and adolescents from grades 4 to 12. Unlike many other general measures of academic or test anxiety, the SAQ gives separate scores for five different dimensions of anxiety: those having to do with report cards, failure, tests, achievement, and recitation. Being able to distinguish among these different sources of anxiety can make this a useful tool for diagnosing and treating school anxiety. An example item from the Report Card Anxiety scale is: "How nervous do you feel when you start to look at your report card?" Students respond on a 5-point scale, going from "frequently" to "seldom" or "a lot" to "not much." The SAQ subscale reliabilities range from .69 to .91, and scores have been found to be related to teacher behavior and academic achievement.

References: Bergan, 1968; Dunn, 1968, 1969.

Source: James A. Dunn, American Institute for Research, P. O. Box 1113, Palo Alto, CA 94302.

6. Achievement Anxiety Test (AAT)

Authors: Richard Alpert and Ralph Haber

Description: Most other measures of anxiety assume, implicitly at least, that anxiety always lowers productivity. The authors

of the AAT wanted to distinguish between people who were hindered by anxiety and those who were helped. The AAT thus contains two separate scales for facilitative (AAT+) and debilitating (AAT-) anxiety. Each item in the measure is followed by a 5-point scale with various phrases at each end point. Sample items from the AAT+ scale are: "I work most effectively under pressure, as when the task is very important," "Nervousness while taking a test helps me to do better." The items on the AAT- scale are more similar to those of other test anxiety measures: "The more important the examination, the less well I seem to do," "In a course where I have been doing poorly, my fear of a bad grade cuts down my efficiency." The reliabilities of both scales are in the eighties, and a test-retest reliability over 8 months was found to be .76, indicating that the AAT measures a fairly stable trait. While the two scales are not independent, their intercorrelation is far from perfect, averaging around -.37. This indicates that although the two types of anxiety are related, they are distinct enough to merit separate examination. The validity of the AAT is supported by significant correlations with other anxiety measures, and the AAT adds significantly to the ability to predict academic grades from aptitude measures. The AAT is a useful measure for a college student population.

Reference: Alpert & Haber, 1960.

Source: Alpert & Haber, 1960.

7. Writing Apprehension Measure

Authors: John A. Daly and Michael D. Miller

Description: This 26-item measure would seem to be appropriate for use with high school and college students and with adults. Half of the items are statements indicative of anxiety about writing; the others indicate a lack of anxiety. Students respond to each statement on a 5-point agree-disagree scale. Scoring by hand is simple and fast. For use outside of a classroom situation, the authors recommend dropping six items and give a revised scoring formula for this case. Sample items include: "I avoid writing," "My mind goes blank when I start to work on a composition," "People seem to enjoy what I write." The measure is reliable; the split-half reliability is .94 and the test-retest reliability over a week is reportedly .92. The only evidence of validity is a negative correlation with responses to the statement, "The writing requirements of my job are very great." It was assumed that those who are high in apprehension about writing would avoid jobs with writing responsibilities. The items have at least face validity, and the authors recommend use of the measure to identify groups of students who may require special handling.

Reference: Daly & Miller, 1975.

Source: Daly & Miller, 1975.

8. Mathematics Anxiety Rating Scale (MARS)

Authors: Frank Richardson and Richard Suinn

Description: The MARS consists of 98 brief descriptions of potentially stressful situations involving the manipulation of numbers or other mathematical concepts. (For example, "Adding two 3-digit numbers while someone looks over your shoulder.") Students respond by indicating the degree to which they would feel anxious in this situation, ranging from 1 (not at all anxious) to 5 (very much anxious). The measure is stable over time, showing a test-retest reliability of .85, and internally consistent with a Cronbach's alpha of .97. This would, however, be expected, due to the extreme length of the measure. Evidence for the validity of the MARS is provided by a decrease in MARS scores after students underwent behavioral therapy for math anxiety. There was also a strong negative correlation (-.64) between scores on the MARS and a mathematics performance measure given under rushed circumstances. This indicates that the MARS is a useful measure of mathematics anxiety, a common problem among college students. The authors suggest that the MARS can be used in diagnosing individuals, in assessing the effectiveness of math anxiety treatment programs, and in developing an anxiety hierarchy for an individual student.

Reference: Richardson & Suinn, 1972.

Source: Richard Suinn, Department of Psychology, Colorado State University, Fort Collins, CO 80521.

9. Teaching Anxiety Scale (TCHAS)

Author: Jane S. Parsons

Description: There are two equivalent forms of the TCHAS designed for preservice teaching interns, and three other versions geared to inservice teachers. The various forms have between 25 and 29 items, and responses are made along a 5-point scale indicating how often a given statement is true (1 = never, 5 = always). Sample statements include: "I feel sure I can be a good teacher," "I feel uncomfortable when I speak before a group." Internal consistency of the measure has ranged between .87 and .94, and stability over a 3-day period is evidenced by a test-retest reliability of .95. The TCHAS has low positive correlations with other measures of general anxiety, indicating that it measures something related to trait anxiety but also distinct from it. There was a significant difference in TCHAS scores between groups of teachers who were identified by their supervisors as being high or low in teaching anxiety. Evidence for validity is also provided by the fact that TCHAS scores were found to decrease over time during a teacher training period. The author does not recommend use of the TCHAS to select, diagnose, or evaluate individual teachers because she feels the instrument is not yet sufficiently developed. She does suggest its use for research purposes, however, and to evaluate the effects of programs that aim to decrease anxiety or increase coping skills. Some informal uses of the TCHAS are also outlined, e.g., as a

counseling tool. Preservice teachers and their supervising staff can go over a blank or completed TCHAS form together to pinpoint individual strengths and weaknesses.

References: Parsons, 1973a, 1973b.

Source: Parsons, 1973a, 1973b.

5. GENERAL ACADEMIC MOTIVATION

5.1. What Is Academic Motivation?

If we wanted to discuss academic performance in the simplest possible terms, we might consider it to be a product of two things: effort and ability. Of course, such a model would be grossly oversimplified, but it would serve to clarify the concept of academic motivation. Effort, or motivation, is the end result of a complex combination of intangible variables and processes within the individual and the environment. Academic motivation is an umbrella concept which covers those aspects of a person other than ability which determine the person's performance in an academic setting.

Some of the single variables which form academic motivation are discussed in separate chapters of this guide: attitudes, needs, curiosity, anxiety, values, and expectancies. Researchers usually deal with one or two of these variables at a time in their studies because of the need to control the effects of variables that are not of interest. Practitioners, on the other hand, are more concerned with finding answers to fairly straightforward questions which do not require strict adherence to the scientific method. For them, global measures of academic motivation can sometimes be of use.

Two types of academic motivation measures should be distinguished. The first provides a single score that represents the amount of effort an individual is likely to put into academic work. Four of the six measures described in this chapter are of this type. A single-score motivation measure provides a simple answer to the question, "How motivated is this person?"

A second type of measure gives scores on a number of separate dimensions of academic motivation. To some extent, they are like collections of single-motive scales. Two examples of this type of measure are described in this chapter: the Children's Preference, Orientation, and Motive Scales, and the Academic Motivations Inventory.

The multiple-scale type of measure does not provide a simple answer to the question of how motivated a person is, but it does give a more useful set of answers for some purposes. If a practitioner's intent is to try to increase the academic motivation of individual learners, it does not help a great deal to know that a certain student got a low score on a single-score measure of academic motivation. Knowing only that the student is not motivated does not indicate in any way what should be done about it. A multiple-scale measure, in contrast, provides a profile of different aspects of motivation, and this is more likely to suggest strategies for change.

5.2 How Can General Academic Motivation Measures Be Used?

1. As a first step towards diagnosis. As discussed above, a single-score academic motivation measure only tells how likely an individual is to work hard at school. If time and resources are severely limited, a general measure might be used to identify those students with the lowest motivation scores, who would then undergo more intensive diagnosis and counseling.
2. To assess the impact of different kinds of educational environments and methods. Are children in open schools more motivated than those in traditional schools? Does a course in study skills

or a series of pep talks have any impact on motivation? General measures might help to answer questions like these.

3. To predict academic failure and attrition. Most of the general measures in this chapter have been successful at identifying students who were headed for academic trouble. Early warning of such problems increases opportunities for doing something about them.

4. To equalize groups for educational research. A researcher testing the effects of some new teaching technique and comparing it to another method would want to be sure that the two different groups being taught were equal in ability and motivation. Without such assurance, he/she couldn't be sure that a difference in achievement between the two groups was due to the difference in teaching technique. There are many experimental and statistical techniques for making two groups equivalent. General measures of motivation might be used for such purposes.

For a more thorough conceptual review of academic motivation, see the excellent work by Doyle and Moen (1978).

5.3 Measures of General Academic Motivation

Six measures of general academic motivation are now reviewed. The names of the measures and their appropriate age cohorts are summarized in Figure 5.

Scale	Age level
Children's Preference, Orientation and Motive Scales	8 to 15 years
Junior Index of Motivation	12 to 18 years
School Motivation Test	Junior & Senior High
Keele Academic Motivation Questionnaire	12 to 16 years
Myers Scale of Academic Motivation	High School, College Freshmen
Academic Motivations Inventory	College

Figure 5. Six measures of general academic motivation.

1. Children's Preference, Orientation and Motive Scales

Authors: Daniel Solomon, Arthur Kendall, and Mark Oberlander

Description: This is a battery of instruments developed as part of an extensive study of school environments and their interaction with characteristics of students. Six of the measures given to students were designed especially for the study: (A) Personal expression vs. structured role orientation, (B) Fear of failure, (C) Intrinsic motivation, (D) Class characteristics preferences, (E) Locus of instigation, and (F) Task preference generality-specificity.

The first measure estimates the child's preference for structured situations as opposed to less structured situations that allow for more personal expression. It contains forced choice items such as: "I would rather (a) follow plans in building a model from a kit, or (b) design and build something from scraps of wood."

The fear of failure scale consists of 10 items. For example: "I would rather (a) try to do a job that's very hard, or (b) try to do a job that's fairly hard." The intrinsic motivation scale measures the degree to which the child sees value in doing things for their own sake as opposed to doing them for some external reward. An example of the items in this scale: "Mary is practicing the piano. Why? (a) Her piano teacher is pleased with her. (b) She wants to learn to play it well."

The class characteristics preference instrument measures the child's preference for open vs. traditional classrooms. Sample item: "I would most like a class where (a) the teacher gives kids any help they need, (b) kids spend a lot of time helping each other, (c) the teacher does most of the helping but kids do some, too."

The measure of locus-instigation gauges the extent to which the child feels responsible for initiating his or her own actions versus having someone else initiate them. This is very close to deCharms' concept of the pawn-origin dimension. For example; "When I work hard to learn something, it is usually because (a) I was asked to and agreed, (b) I can't think of anything else to do, (c) I was told to or had to, (d) I decided to." The sixth measure taps the degree to which the child's liking of achievement situations is generalized across many tasks as opposed to a specific few.

The authors claim that it can be used with children from 8 to 15 years old, though it would seem that some changes in

wording might be necessary for the older students in that range. This group of measures covers several important aspects of motivation. Unlike single-score measures of academic motivation, it gives a profile which might be helpful in diagnosing motivational problems. The reliabilities of the scales (generally around .60) are too low for use with individuals, but as a group measure they could be of use to a classroom teacher.

References: Solomon & Kendall, 1974, 1976.

Source: Solomon & Kendall, 1974.

2. Junior Index of Motivation (JIM)

Author: Jack R. Frymier

Description: The JIM was developed over a period of several years, beginning in the early sixties. Experienced teachers were asked to identify students who were very high or very low in academic motivation. These students were given early versions of the JIM, and those items that failed to distinguish between the two groups were dropped. The final version of the JIM contains 80 items of which 50 are scored. The JIM is meant for use with students between 12 and 18 years old. Sample items include: "Our whole trouble is that we won't let God help us." "There is nothing new under the sun." Students respond to each item on a 4-point agree-disagree scale. They are told that the questionnaire is a measure of attitudes and values, rather than academic motivation, and the 30 extra items are there to conceal the test's purpose. The JIM has been shown to be fairly reliable, and its validity is supported by

studies showing correlations with grades, standardized achievement scores, and teacher estimates of motivation. In a longitudinal study it was found that the JIM scores of seventh graders who eventually went to college were significantly higher than scores of those who did not. As would be expected with any general measure of academic motivation, the JIM appears to be measuring many different things. A factor analysis (1970) showed 15 different factors, only the first six of which were easily interpretable. Still, these are problems endemic to all global measures, and of these, the JIM is one of the better developed.

References: Frymier, 1970; Frymier et al., 1975.

Source: Frymier, 1970. Also available in the ETS Test Collection as test No. 004021.

3. School Motivation Test (SMT)

Author: Ivan L. Russell

Description: This 30-item questionnaire takes about 10 minutes to administer. It is appropriate for students of junior and senior high school age. The test consists of statements and questions to which students respond either "yes" or "no." Sample items include: "Does failure discourage you from trying as hard the next time?". "Are you usually on time with written assignments?" "Do you try to make better grades than other students in your class?" The split-half reliability of the test is reported to be .95, showing an extraordinary degree of internal consistency. Scores on the SMT in one study were higher for a group who

volunteered for an academic type of contest than for non-volunteers, and correlations between the SMT and standardized achievement tests were also fairly high. Thus there is evidence of validity and reliability for the group studied (rural Appalachian high school students). The SMT may not necessarily work as well with other types of students, and users of the test should be sure to collect additional motivation data to test its validity in their setting.

Reference: Russell, 1969.

Source: Russell, 1969.

4. Keele Academic Motivation Questionnaire

Authors: James Hartley, Janet Holt, and F. W. Hogarth

Description: This measure was designed to study the effects of motivation on learning by programmed instruction. The measure is more unidimensional than most because items that weren't strongly related to the total score were eliminated. There are 15 items which are answered on a 5-point scale ranging from "very true of me," to "very untrue of me." Some of the items: "I enjoy most lessons," "I work hard most of the time," "I think homework is a bore." The scale can be used with students from 12 to 16 years old. Test-retest reliabilities ranged from .52 to .85 over a 5-month period, with a higher degree of stability for 13 year olds than 14 year olds. There was some support for the validity of the scale, with correlations

with other measures of academic motivation in the .80's. American users of the Keele should note that it was developed with a sample of British school children.

References: Hartley, Holt, & Hogarth, 1971.

Source: Hartley, Holt, & Hogarth, 1971.

5. Myers Scale of Achievement Motivation

Author: Albert E. Myers

Description: This amazingly short (9-item) scale surprised its author with how well it seemed to work. It is quick to administer and score, and it was, in one study at least, related to other measures in the same way as such projective measures as the Thematic Apperception Test. Most of the items are academically-related. For example: "Do you think your fellow students in high school think of you as a hard worker?" "Do you have a very strong desire to excel academically?" Students indicate the degree to which the statement is true on a 6-point scale. The scale has been used with high school students (Myers, 1965) and with college freshmen (McGausland & Stewart, 1974). In the latter study, the Myers scale was a better predictor of college grades than the much longer Survey of Study Habits and Attitudes Scale. There are disadvantages to this measure, of course. Since it does not give subscores of any kind, it is not useful for diagnosis and counseling. The intent of the scale is very obvious, so scores could easily be faked. There is also little evidence that what it measures should be called academic motivation, though it seems to work like such

a measure. With these drawbacks, it is intriguing that the Myers scale works at all. Using it in conjunction with other measures is certainly worth the small effort it takes.

References: Myers, 1965; McCausland & Stewart, 1974.

Source: Myers, 1965.

6. Academic Motivations Inventory (AMI)

Authors: Kenneth Doyle, Jr. and Ross Moen

Description: This instrument, which is undergoing a cyclical process of trial and refinement at the University of Minnesota, shows promise of becoming an extremely valuable instrument for use with college students. Potential uses outlined by the authors include admissions decisions, guidance, adjustment, curriculum planning, and evaluation and improvement of instruction. The last two areas suggest making changes in the academic environment to better serve the needs of students, a strong concern of practitioners of instructional development.

The most recently published account of the AMI describes it as containing 75 items cast as statements, with students responding on a 5-point scale ranging from "not at all true of me" to "extremely true of me." A factor analysis of the instrument resulted in nine scales being defined: Desire for Self Improvement, Anti-School, Desire for Esteem, Enjoyment of Learning, Enjoyment of Assertive Interactions, Resentment of Poor Teaching, Desire for Academic Success, Desire for Career Preparation, and Enjoyment of Passive Interaction. The internal consistency of these scales ranges from .52 to .87, with the majority being over .70.

The use of Motivations rather than Motivation in the title of this measure must be deliberate, since the authors clearly recognize the multidimensionality of what makes students work in college. The degree of care and rigor going into the development of the AMI makes it likely to become the best general instrument for use with this population.

References: Doyle & Moen, 1978; Moen & Doyle, 1977.

Source: Kenneth O. Doyle, Jr., Measurement Services Center, University of Minnesota, 9 Clarence Avenue, S. E., Minneapolis, MN. 55414.

6. MOTIVATION AND ATTITUDE

This section is divided into three parts. The first presents a brief history of the development of attitude theory with an emphasis on conceptual and methodological problems. The second summarizes specific problems related to the measurement of attitude, and the third suggests the ways that attitude may be related to motivation. Throughout, emphasis is on developing a presentation that is both usable and interpretable, and susceptible of practical understanding and use without any special background in attitude theory or measurement. Examples of attitude scales and techniques are used to aid comprehension and facilitate application.

6.1 Brief History of the Development of Attitude Theory[1]

In 1967 Gordon Allport, an eminent psychologist, wrote that "the concept of attitude [was] probably the most distinctive and indispensible concept in contemporary American social psychology" (p. 3). The origins of attitude theory and research lie within the context of research in social psychology, and it is out of that milieu that educators have been attempting to wrestle some agreement on the nature and structure of attitude. It has not been an easy task.

Like most abstractions, attitude appears to have more than its proper share of meanings. The term is derived from the Latin, aptus, and denotes fitness or aptness like its by-form, aptitude. Like aptitude,

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[1] This section draws heavily from the excellent review and research of Barbara G. McKee (1977).

attitude means an abstraction--what some have called a psychological construct--that takes on its meaningfulness in theory rather than in reality. Consequently, many theorists have defined attitude differently. Note, for example, the ambiguity that is often associated with replies to questions like, "What do you mean by a bad attitude?"

One of the first psychologists to use the term was Herbert Spencer who, in his 1862 edition of First Principles, wrote that in

> arriving at correct judgment on disputed questions much depends on the attitude of mind we preserve, while listening to, or taking part in, the controversy: and for the preservation of a right attitude it is needful that we should learn how true and yet how untrue, are average human beliefs.
>
> (Vol. 1, p. 1, as cited by Allport, 1967, p. 4)

The beginnings of theory and research on attitude were laboratory based inquiries that stressed physiological correlates. Thus it is not surprising that early research on attitude is filled with references to reaction time, perception, memory, and volition, as well as terms like muscular set, mental and motor attitudes, and tendencies (Rokeach, 1968).

By the end of the 19th century some had become disenamoured with attitude research because it had been fairly widely agreed that attitude was an unconscious phenomenon to start with and thus difficult, if not impossible, to understand and quantify. It was Sigmund Freud who resurrected interest in attitudes. Allport argues that Freud "endowed them with vitality, identifying them with longing, hatred and love, with passion and prejudice, in short, with the onrushing stream of unconscious life" (Allport, 1967, p. 5).

While the works of Freud were reviving interest in attitudes for psychoanalysts and psychologists, Thomas and Zaniecki (1918) were doing

the same thing for sociologists. In their classic and moving work on the Polish peasant, Thomas and Zaniecki are generally credited with having given systematic priority to the concept of attitude. After the publication of their work, the term attitude was adopted with enthusiasm by scores of writers (Allport, 1967). Yet according to Rokeach, a principal theorist in his own right, it was not until the 1940's and the publications of Erich Fromm's Escape From Freedom (1941) that the relevance of social attitudes to personality theory became recognized (Rokeach, 1968).

In a fine summary of the current state of affairs in the development and meaning of attitude theory and research, Martin Fishbein and I. Ajzen (1975) argue that part of the ambiguity may be the result of the diverse circumstances in which attitude has been used as both a descriptive and a predictive variable. Social discrimination, voting preferences and behavior, product preference in consumer studies, brand loyalty, and brand images have all been objects around which measures of attitude have been employed in order to predict an outcome of importance, i.e., voting for a particular candidate or buying a specific product.

In partial reaction against the lack of conceptual clarity and empirical definition that has often typified research on attitude, some researchers have advocated the abandonment of the term altogether. In 1947, for example, Dobb argued that while attitude may be a socially useful construct, it has no systematic status as a scientific construct and hence should be replaced with constructs from learning theory. Blumer (1955) also recommended that the concept be abandoned because "it lacks an empirical reference and hence cannot be used effectively as a unit of analysis in either personality or social action investigations" (Blumer, 1955, p. 60).

Dobb and Blumer, however, were in the minority, and as Rokeach said, "It is safe to predict that the concept of attitude will, despite its ambiguity, remain with us for many years..." (Rokeach, 1968, p. 111).

Summarizing this state of affairs, McKee (1977) concluded,

> Most researchers have come to a loose understanding of the definition of attitude. Fishbein and Ajzen (1975) say 'most investigators would probably agree that attitude can be described as a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given subject' (p. 6). Consensus on a description or definition of attitude, however, does not eliminate the existing disagreements among attitude researchers. Consensus merely obscures the disagreements by providing a description with multiple interpretations (Fishbein & Ajzen, 1975). Attitude is defined according to Rokeach (1968) as 'a relatively enduring organization of beliefs around an object or situation predisposing one to respond in some preferential manner' (p. 112).

No matter the theorist or context of the research (cf. the reviews by Campbell, 1963; Greenwald, 1968), definitions of attitude characteristically contain the following terms, although they may be themselves variously defined and differentially weighted: (1) a learned disposition or predisposition, (2) to respond, (3) consistently, (4) in a favorable or unfavorable manner, (5) to a given social object, (6) in interaction with other situational or dispositional variables. Given this definition, we turn now to problems associated with measuring attitude.

6.2 Problems in Measuring Attitude

To say that attitudes are "predispositions" is to say that they cannot be measured directly. As was suggested in the discussion of psychological constructs, since attitudes are abstractions they must be measured indirectly. However, from a behavioral point of view, it is reasonable to ask how it is that certain responses appear to be paired

so consistently with particular stimuli, as in stimulus-response conditioning. According to Fishbein and Ajzen (1975), "attitude theorists appear to be interested in how implicit, evaluative responses become associated with a given stimulus object" (p. 25).

To explain this relation, Milton Rokeach has argued his theory of belief congruence. Simply stated, the theory contends that people tend to act to support and maintain their beliefs, that they tend more often than not to agree with others whom they perceive as people who share their beliefs, and that they tend more often than not to disagree with individuals who disagree with them. Attitudes, to Rokeach, are an enduring system of beliefs about an object or situation. He argues further that since attitudes have both cognitive and affective components, there are both knowing and feeling aspects to attitude. Triandis (1971) argues further that attitude needs to include behavioral components in addition to the cognitive and affective. Thus, his conceptualization is even more inclusive than Rokeach's.

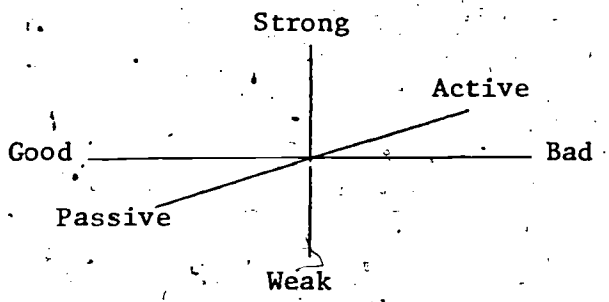
Efforts to measure attitude have ranged from galvanic skin response readings to paper and pencil instruments that require response to both pictorial and verbal stimuli. Most popular has been the paper and pencil response to verbal stimuli. Central to this measurement effort has been a question about the proper configuration of an attitude. Is attitude to be understood, as Rokeach has suggested, as a predisposition to respond in a positive or negative fashion and thus modeled as a straight line as in the following example?

MY ATTITUDE TOWARD SCHOOL

Positive ⟷ Negative

Or is attitude to be conceptualized as a multifaceted construct that includes more than one component?

MY ATTITUDE TOWARD SCHOOL



In the second example, a person's attitude would be understood as a point described by scores on all three continua rather than on a single line. In this case, an attitude score is a point enscribed in a 3-dimensional space defined by the bipolar terms that anchor the ends of the lines (cf. Osgood, Suci, & Tannenbaum, 1957). Single line or monotonic conceptions of attitude have been developed by Guttman (1947). Non-monotonic theories have been argued by Thurstone (1927), Likert (1932), and Osgood, Suci, & Tannenbaum (1957). The difference between the two is simple.

In the first instance, a monotonic scale means that, through careful selection, a group of attitude items will be constructed such that a person who possesses a positive attitude toward a given object or class of objects will predictably respond to all or a given number of the items

in a favorable direction. On the other hand, in a Likert scale, or what is today popularly understood as a 5-point "strongly agree-strongly disagree" scale, it is not assumed that because a person agreed with one item, that he or she will also agree with the next item. Likert scales are nonmonotonic, as is the semantic differential (cf. Osgood, Suci, & Tannenbaum, 1957). But the semantic differential is also multidimensional, in that there are three dimensions rather than one that describe verbal meaning. Called evaluation, potency, and activity, these three dimensions have been shown, time and again, to correlate with nonmonotonic measures of attitude, but the strongest relationships have consistently been with the evaluative dimension.

The work of Osgood, Suci, & Tannenbaum (1957) centers on an instrument called the semantic differential. Essentially, this is a measurement device that uses previously tested (already used) bipolar scales such as "good--------bad" to define a 3-dimensional space. Semantic differentials have the virtue of being deceptively easy to construct and also of possessing wide applicability to any number of attitude objects. With reference to the 1957 work, bipolar scales can be carefully chosen that will represent all three (evaluation, potency, and activity) dimensions or the instrument can be constructed totally from evaluative scales, such as "good-bad," "nice-awful," "sweet-sour."

For example, in order to use the semantic differential to measure students' attitudes toward a course they had just completed in English, an instrument such as the one suggested in Figure 6 might be constructed. The "X's" made by students on the bipolar scales would be translated into numbers according to the legend beneath the responses. (This legend has been inserted for the purpose of clarification but does not appear in

THIS COURSE IN ENGLISH

Good	X				0			Bad
	+3	+2	+1	0	-1	-2	-3	
Awful	0					X		Nice
	-3	-2	-1	0	+1	+2	+3	
Sweet			X		0			Sour
	+3	+2	+1	0	-1	-2	-3	
Unpleasant							X	Pleasant
	-3	-2	-1	0	+1	+2	+3	
Worthwhile			X			0		Worthless
	+3	+2	+1	0	-1	-2	-3	

Jack's Score (X's) = +10, divided by number of scales (5) = +2.

Sally's Score (0's) = -10, divided by number of scales (5) = -2.

And reported as:

ATTITUDE TOWARD "THIS COURSE IN ENGLISH"

Postive		Jack				Sally		Negative
	+3	+2	+1	0	-1	-2	-3	

Figure 6. Example of evaluative scales from semantic differential used to measure attitude showing weighting and scoring for individuals.

ordinary use of the instrument.) Considering the responses as suggested in Figure 6, Jack's responses as indicated by "X's" and Sally's as indicated by "0's" would be added algebraically to different totals. Jack's score would total +2 or 10/5, and Sally's score would total -2 or -10/5. Based on scores like these taken over an entire class, a distribution of scores that represent the group can be developed from which we can determine the

students with positive and negative attitudes through a comparison of their scores. However, it is not possible to claim that Jack's score or attitude is equally as positive as Mary's score is negative. This is due to a problem endemic to this type of measurement instrument. Because of space limitations, the problem is not discussed in detail here; for a full explanation of the differences between what are called nominal, ordinal, interval, and ratio scales, as they relate to attitude measurement, consult Allen Edwards (1957).

One of the advantages of the semantic differential is that it can be easily used with a wide variety of attitude objects without extensive development time. This occurs as long as one is willing to be persuaded by the evidence reported in Osgood, Suci, & Tannenbaum (1957) and the numerous studies that have sprung from that inquiry. With careful attention to the selection of the bipolar scales to insure that they are meaningful when considered over the concept to be measured, the semantic differential provides highly reliable scores.

On the other hand, the semantic differential is not the most popular attitude measurement technique available. That distinction probably belongs to the Likert scale or a Likert-like scale. More commonly recognized as a "strongly agree-strongly disagree" scale, the Likert is a non-monotonic scale (the item responses don't predict each other) that can be used to measure attitude toward almost any object. This type of scale is premised on the belief that attitude is best represented as a positive or negative disposition with respect to some object, and further, that the disposition can be represented by a universe of descriptive statements that denote the object when seen from a positive or negative point of view.

To begin with, a pool of short statements or complete sentences that are related to the object are generated by the instrument developer or others. These statements are understood to be a sample from the population of all meaningful statements that could be made about the attitude object. The statements should be connotative rather than factual so as to provide opportunity for a person to agree or disagree. For example, in an effort to measure a student's attitude toward a teacher, it would be unwise to employ an item such as, "This teacher wears glasses." A response to this item would be based on facts rather than, as Rokeach would argue, a set of beliefs. Better to write "This teacher is excellent," or "This is an excellent teacher," or even "Excellent teacher." The respondent is usually asked to reply on a five-point scale ranging from strongly agree to strongly disagree (Edwards, 1957).

Edwards (1957, pp. 13-14) has developed a list of recommendations to guide the construction as well as the selection of items for inclusion in verbal attitude scales; 14 of these recommendations are summarized in Figure 7. Final selection of the items to be included in the scale should be guided not only by Edward's suggestions, but also by the empirical results of careful pilot testing of the instrument. These results should be analyzed according to conventional item analysis procedures and should investigate the discriminability of each of the items (i.e., the analysis should indicate those items that tell the people with positive attitudes (defined as low scores, for example) apart from those people with negative attitudes (defined as high scores) (see Figure 8).

The work of Louis L. Thurstone (1927) has produced at least three methods for measuring attitude. These methods include paired comparisons, equal appearing intervals, and successive intervals. Common to all three

1. Avoid statements that refer to the past rather than the present.

2. Avoid statements that are factual or capable of being interpreted as factual.

3. Avoid statements that may be interpreted in more than one way.

4. Avoid statements that are irrelevant to the psychological object under consideration.

5. Avoid statements that are likely to be endorsed by almost everyone or no one.

6. Select statements that are believed to cover the entire range of the affective scale of interest.

7. Keep the language of the statements simple, clear, and direct.

8. Statements should be short, rarely exceeding 20 words.

9. Each statement should contain only one complete thought.

10. Avoid universals such as all, always, none, never.

11. Words such as only, just, merely ...should be used with care and moderation in writing statements

12. Whenever possible, statements should be in the form of simple sentences rather than compound or complex sentences.

13. Avoid the use of words that may not be understood.

14. Avoid the use of double negatives.

Figure 7 Fourteen suggestions on the construction and choice of items for inclusion in verbal attitude scales (Edwards, 1957, pp. 13-14).

method is the use of expert judges who rate or categorize the items intended for inclusion in the attitude scale. Items on which judges tend to disagree widely are usually discarded from use. Ultimately, a numerical value indicating the importance of the item-- for example, the average judge rating--is then attached to each of the items These items are then used to give scores to people who respond to the instrument.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. This teacher is excellent.	X / 1	/ 2	/ 3	0 / 4
2. This teacher is well prepared.	/ 1	X / 2	0 / 3	/ 4
3. This teacher gives good examples.	X / 1	/ 2	/ 3	0 / 4
4. This teacher gets confused.	0 / 4	/ 3	X / 2	/ 1
5. This teacher ignores me.	0 / 4	X / 3	/ 2	/ 1
6. This teacher asks important questions.	/ 1	X,0 / 2	/ 3	/ 4

Jack's Score (11's) = 11.

Sally's Score (2's) = 21.

And reported:

ATTITUDE TOWARD MY TEACHER

Jack (11)		Sally (21)
Positive (6)	Neutral (15)	Negative (24)

Figure 8. Example of a Likert-like instrument to measure attitude toward a teacher showing weighting of responses and scoring for individuals.

Dillehay, Bruvold, & Siegel (1967) used the method of equal appearing intervals to develop a scale to measure the potability of water (see Figure 9). Subjects were asked to take a drink of water and then to select the three words from the listed adjectives that best described the water. Individual scores are computed by simply taking the arithmetic mean of the weights that correspond to the three terms selected. This type of measurement permits us to rank people and say that one person is more positive about an object than is another; however, the equal appearing intervals technique does not permit us to say that the distance between people's scores is the same throughout the entire score distribution.

Scale Value	Adjective
1.24	horrible
1.78	unfit
2.11	bad
2.46	undesirable
3.14	poor
3.54	inferior
4.25	below par
4.92	can be tolerated
5.95	passable
6.26	OK
7.94	likable
8.63	tasty
9.19	desirable
9.45	enjoyable
10.00	delightful
10.59	delicious

Figure 9. Scale values as employed in an equal appearing intervals scale to measure the potability of water (Dillehay, Bruvold, & Siegel, 1967).

In summary, the several methods that have been described for measuring attitude can be grouped into three classes: ordered scales, agreement scales, and semantic differentials. Ordered scales include all three of those developed by Thurstone as well as the monotonic scaling techniques of Louis Guttman (1947, 1950). Agreement scales include the entire range of modifications available as Likert scales, and the semantic differential stands in a category by itself (Henerson, Morris, & Fitz-Gibbon, 1978).

Efforts to measure attitudes that are believed to be important in specific educational contexts are a myriad. There are, however, several useful sources that actually show the attitude scales and also, in some instances, summarize or evaluate evidence describing how the measures perform. Central among these sources for attitude measures are: Shaw and Wright (1967); Dowd and West (1969); Robinson and Shaver (1973); Simon and Boyer (1974); Buros (1975).

One newly developed measure of educationally related attitudes is the Adjective Rating Scale (Wick et al., 1976). The instrument, designed to measure the course or program-oriented attitude of students in both high schools and colleges, employs 24 adjectives in a unipolar format. The adjectives are rated across a 4-point scale from "extremely," "very," "somewhat," to "not at all." The terms were selected from banked descriptors frequently used by college students to describe courses they had just completed. The Adjective Rating Scale is a nonmonotonic device that reports a total score and five subscales--Interest Value, Emotional Appeal, Practical Value, Dullness, and Difficulty. The instrument can be hand scored and has performed well in several published studies as both a predictor and a

criterion measure (Hubbard, 1974; Kelly et al., 1976; Kelly & Chapman, 1977; Chapman, 1975; McKee, 1977)

6.3 Measures of Attitude Toward Education and Instruction

This section presents three measures of attitude toward education and instruction. Each measure is summarized and reviewed briefly. The titles and appropriate age cohorts for each measure appear in Figure 10. The reader is advised that there are a great number of measures of attitude toward education and discrete aspects of it, e.g., teachers, school practices, courses, programs. The array that follows is meant to be suggestive of some of the better measures available for practitioner use. We do not claim that it is either exhaustive or comprehensive, but it is illustrative. Readers requiring a wider search are referred to the source materials and reviews referred to in the following section.

Title	Age group
Education Scale VII	Graduate Students
The Purdue Teacher Opinionnaire	Teachers
Adjective Rating Scale	High School and above

Figure 10. Three measures of attitude toward various aspects of education.

1. Education Scale VII

Description: The instrument is designed for use with adult graduate students and is available in both a short and a long form (ES-VI). This is a multifactor instrument that reports two scores, progressivism and traditionalism. There is some evidence of factorial validity and reliability, but the measure is not strong enough to be used with individuals. It should be used to estimate group scores. It is a forced choice measure that employs items such as: "We should fit the curriculum to the child and not the child to the curriculum," "Learning is experimental; the child should be taught to test alternatives before accepting any of them."

Reference: Dowd & West, 1969.

Source: Fred N. Kerlinger, Amsterdam Weeperplein 8, Amsterdam C, Netherlands.

2. The Purdue Teacher Opinionnaire (TPTO)

Description: This instrument measures teacher morale and reports a total score and 10 part scores such as Rapport with Principal, Teacher Salary. Used effectively with both elementary and secondary teachers, the instrument reports normative data for over 3,000 teachers. Taking approximately 25 to 30 minutes to administer, TPTO's 10 scales show reliabilities between .62 and .88. Some validational evidence is available as well as an alternate form.

Reference: Dowd & West, 1969.

Source: University Book Store, 360 State Street, West Lafayette, IN 47906 or Ralph Bentley and Avesno M. Rempel, Purdue University.

3. Adjective Rating Scale (ARS)

Description: This multifactor instrument measures the attitude of high school and college students toward courses and academic programs. It is composed of 24 adjectives that college students frequently use to describe courses they have just completed. It employs a 4-point scale ranging from "extremely" to "not at all." In previous studies the ARS has demonstrated acceptable internal consistency estimated by Cronbach's alpha (.70 - .89) as well as stability over time. It reports five subscales: Interest Value, Emotional Appeal, Practical Value, Dullness, and Difficulty. The ARS has been effectively used with both high school and college students to predict achievement and retention.

References: Hubbard, 1975; Kelly et al., 1976; Kelly & Chapman, 1977; McKee, 1977.

Source: Edward F. Kelly, 150 Marshall Street, 117 Huntington Hall, Syracuse, New York 13210.

6.4 Relating Attitude to Motivation

How are attitude and motivation related? When classroom teachers say, "Peter just doesn't have a positive attitude," are they saying the same thing as the other teachers who say, "Peter lacks motivation"? If we were able to increase a student's motivation, would we also increase attitude (positively or negatively) toward the object under study or toward the activity of studying it? Lastly, if a person enters an experience with a high positive attitude as well as high motivation,

to what extent are we able to track and effect changes in either one of these constructs? Reviews of available literature reported above suggest that complete answers to these questions are not currently available.

However, there has been a beginning and a direction indicated for further research. Given that motivation is understood within the context of social learning theory, the question becomes, to what extent are there theories of attitude which contribute to the explanation and definition of attitude within the context of expectancy and value theory? Transition from the theory of motivation presented earlier and the several theories of attitude summarized in this section resides in the notion of cognitive consistency as a bridge between attitude and motivation.

Of all the attitude theorists reviewed, the work of Milton Rokeach and his principle of Belief Congruence suggests the firmest grounding for an examination of the relationships between attitude and motivation. As McKee (1977) wrote:

> Rokeach asserts that we tend to value a given belief, subsystem, or system of belief in proportion to its degree of congruence with our own belief system, and further, that we tend to value people in proportion to the degree to which they exhibit beliefs or systems of beliefs congruent with our own. Attitudes, under the Principle of Belief Congruence, are an enduring organization...centered around an object or situation. Attitudes have cognitive and affective properties by virtue of the fact that the several beliefs comprising attitudes have cognitive and affective properties that interact and reinforce one another (pp. 23-24).

The cognitive properties of attitude encompass beliefs, values and knowledges while the affective components entail feelings and emotions. People carry beliefs, values, and knowledge about objects, and these attitudes can be influenced in predictable ways. To say that a person is motivated is to claim a state of affairs that is best described by

several other factors. These factors, the informing characteristics of motivation, are level of arousal, expectancy of success and failure, goals (values, beliefs), and satisfaction.

Cognitive consistency theory argues that differences in level of expectation on any of the above mentioned characteristics, with the possible exception of arousal, will result in an effort to minimize or eradicate the discrepancy between that which is self-believed and what appears to exist in the environment.

In simpler language the example runs:

> Peter was really up for the race. He had practiced hard and based on previous races, he had every expectation that he was a faster miler than his competition. Winning would be neat, but putting the gold on the mantle would even be better. What would the coach say? Probably something like "Nice going" and that would be a lot for him, old stiched lips. But then, one way or the other, Peter really liked to run, more than that, he liked to compete. Most of all, he enjoyed winning. Running in the open mile was worth doing. It was honest and straight out. It wasn't like school at all.

Working through this little vignette, rewritten into the parlance of motivation and attitude theory, the story runs something like this:

> The idea of running the mile was a stimulus that was arousing for Peter. He was excited about the prospect. Based on his previous performances and on the feedback he had received, he believed that his probability of success was quite high. He believed that he would win. Accomplishing the win would be reinforcing in and of itself, but putting the medal on the mantle would be a source of satisfaction that would exceed even the racing victory. Peter believed that running and winning the race were valuable goals to achieve.
>
> Peter didn't win the race. He won a bronze, not a gold metal. His attitude toward running the mile was extremely positive, but his attitude toward this particular race was negative. Peter was still motivated to practice, to try again to win, and get old tight lips to say something reinforcing. His expectancy for success had dropped somewhat, and furthermore, he was not very satisfied with the reward he had received for all his training efforts. One

way or the other, he still wanted to run and win at the mile because he still believed that that was important to do. His attitude toward "running the mile" was positive. His attitude toward this particular race was negative, but his motivational state was proactive.

Attitudes have to do with dispositions that describe beliefs, feelings, and related behaviors. Attitudes have to do with toward--people have attitudes toward objects. On the other hand, motivation has to do with arousal, expectancy, goals, and satisfactions from and toward. It is not odd to ask a person, "What motivates you to run the mile?" On the other hand, it would be unusual to ask, "What attitudes you to run the mile?" Attitude is generally understood as having a reference toward something called the attitude object rather than as a reference from something. Motivation, on the other hand, goes in both directions, at least as suggested by common usage and as reinforced by theory and research. People are motivated by something to something. While motivate is an action term, grammatically an infinitive, attitude is forever a noun, a static consideration. Attitude can be altered, but it would be unusual to say, "I am going to attitude this person," as one might say, "I am going to motivate this person." Attitude describes a state of affairs. Motivation and to motivate describe both a state of affairs--being motivated--and the process of bringing a person to a certain state of affairs, a process called motivation.

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