

AN INVESTIGATION OF THE RELATIONSHIPS BETWEEN
ATTRIBUTIONS FOR SUCCESS AND FAILURE, AND
ACADEMIC ACHIEVEMENT OF FOURTH GRADE
NON-HANDICAPPED AND LEARNING
DISABLED BOYS AND GIRLS

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We hereby recommend that the _____ dissertation _____ prepared under
our supervision by Sondra Bonnington
entitled An Investigation of the Relationships Between
Attributions for Success and Failure, and Academic
Achievement of Fourth Grade Non-Handicapped and
Learning Disabled Boys and Girls

_____ be accepted as fulfilling this part of the requirements for the Degree of _____

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DEDICATION

This dissertation is dedicated to my mother,

Carolyn Kenny Ryan

Her love, example, and active encouragement
have enabled me to reach this goal.

ACKNOWLEDGEMENTS

I wish to acknowledge the help I received from many, many people along the way. It is my good fortune that you are too numerous to name on this page. Your assistance is appreciated and will be remembered. A special thanks goes to the parents for their consent, and to their fourth grade children who volunteered to participate in this study.

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CHAPTER I

INTRODUCTION

Public schools have been challenged to mainstream exceptional children, "to teach handicapped children together with normal peers whenever possible" (Kirk & Gallagher, 1979, p. 480). Our schools are dealing with conflicting demands when it comes to providing each handicapped child the free and appropriate public education required by P.L. 94-142. What is "appropriate" has yet to be defined.

A need is felt by educators to meet this challenge. It would be helpful if some objective measure(s) could be used to predict which children would be likely to succeed in a regular class. Intuitively, adults know that motivation is often the deciding factor which tips the scale towards success or failure. If particular attitudes, feelings, or motives could be identified and/or measured, perhaps a "student profile" would emerge. Perhaps these affective competencies could be taught to those who lacked them.

The affective aspects of maximizing academic success have received little attention. For the most part teacher

training in special education has focused on methods of remediating handicaps and ways of compensating for disabilities so as to facilitate the learning of academic subjects. While motivational variables have been acknowledged as crucial elements which enter into the learning equation, the topic has been so difficult to treat in a rigid experimental design (Osborn's Law. Variables won't, constants aren't) that most of the research done has been restricted to laboratory settings. But out of this research have come hypotheses with relevance to all classrooms.

Three theories which have special relevance for both handicapped and non-handicapped children are locus of control, learned helplessness, and attribution theory. While the majority of the research in these areas has been done with an adult population, primarily college students, the studies which have involved children have shown similar results.

Locus of Control

One aspect of motivation which appears to be closely tied to achievement is the locus of control concept. Locus of control is one derivative of Rotter's social learning theory (Rotter, 1966). People with an internal locus of control believe their behavior effects or controls the

reinforcement they receive. If people believe their behavior makes no difference, that good things as well as bad things happen because of chance or the whims of powerful others, then they are said to have an external locus of control. For recent comprehensive reviews of this construct see Phares (1976, 1978) and Rotter (1975). The related literature is fully described in Chapter II.

The Intellectual Achievement Responsibility Questionnaire (Crandall, Katkovsky, & Crandall, 1965) is usually referred to by the initials IAR (Crandall, et al., 1965) but is also known as the IARQ (MacDonald, 1973). This measure of internal-external locus is the one most often used with children (Phares, 1976) and is psychometrically acceptable (MacDonald, 1973; Phares, 1976). The IAR was used in the studies cited in the following paragraphs.

Children with an internal locus of control have been found to be able to delay gratification (Shipe, 1971), to persist longer (Dweck & Reppucci, 1973), and to be more creative (DuCette, Wolk, & Friedman, 1972).

The research on performance and achievement relationships to internal locus has been conflicting, whereas a positive relationship between grades and internal locus of control has been established. Midlarsky and McKnight (1980) found that internals outperformed externals on the tasks

assigned to them. Other researchers have found no relationship between task performance and internal locus (Morris & Messer, 1978) or that relevant cues can increase the performance of external students so that they surpass the internal students (Dollinger & Taub, 1977; Howie, 1975). Some researchers have found a positive correlation between internal locus and achievement (Johnson, 1976; McGhee & Crandall, 1968; Messer, 1972; Reimanis, 1973; Solomon, Houlihan, Busse, & Parelus, 1971; Vogel, 1976; Wood, 1978) and other researchers have not found any relationship between locus of control and achievement (Katz, Cole, & Baron, 1976; LaVoie & Adams, 1975; Lowden, 1979). However LaVoie and Adams (1975) did find a significant relationship between internal locus and grades. McGhee and Crandall (1968) and Messer (1972) both found a stronger correlation between internal locus and grades than they did with achievement.

Sex differences have been found by many researchers (Brady, Figuerres, Felker, & Garrison, 1978; Brady, Rickards, & Felker, 1975; Felker & Bahlke, 1970; Felker & Thomas, 1971; Messer, 1972, Solomon, Houlihan, & Parelus, 1969; Stanwyck & Felker, 1971; Taub & Dollinger, 1975). However others have not found this to be true (Lifshitz, 1973; Johnson, 1976; Vogel, 1976; Wright & DuCette, 1976).

Some researchers have found age or grade effects (Lifshitz, 1973; Wood, 1978) whereas others have not (Arlin, 1975; Barnett, 1978).

Some studies have been done with handicapped children in institutions for the retarded (Shipe, 1971) and for the blind (Jones & McGhee, 1972). Research has been carried out with junior high learning disabled (LD) boys (Bendell, Tollefson, & Fine, 1980; Tarver, Hallahan, Cohen, & Kauffman, 1977), both normal and LD teenaged boys and girls (Hallahan, Gajor, Cohen, & Tarver, 1978), normal and LD boys in grades 3 and 6 (Hill, 1980), and normal and LD boys and girls in grades 3 through 6 (Chapman & Boersma, 1979). Raschke (1979) studied learning and behavior disordered children. Chan and Keogh (1974) studied third grade normal achievers and educable mentally retarded students matched on mental age. In three studies normal achievers took credit for success (i.e. had an internal locus for positive outcomes) whereas the handicapped children were significantly less likely to make internal attributions for success (Chan & Keogh, 1974; Chapman & Boersma, 1979; Hill, 1980). The reverse, handicapped children taking responsibility for failure and normal children making external attributions for failure, tended to be true also, but this relationship

reached significance only in Chan and Keogh's study.

Chapman and Boersma (1979) noted that

a link between locus of control and learning would seem logical, given that school achievement requires a degree of effort and persistence in academic tasks and that such behaviors are unlikely to occur if the student sees little relationship between his efforts in learning and the outcomes. (p. 250-251)

MacDonald (1973) stated that "all of the research points to the same conclusion: people are handicapped by external locus of control orientations" (p. 170). Other researchers have linked external locus of control with learned helplessness (Dweck & Reppucci, 1973; Kennelly & Kinley, 1975) and depression (Tesiny, Lefkowitz, & Gordon, 1980).

Learned Helplessness

People who have "learned helplessness" are those who have learned that there is no connection between their behavior and the negative outcomes they experience. Seligman (1975) explained that when events are uncontrollable people become passive and no longer try to act, unable to perceive that any success could be the result of their behavior, and anxious. When the outcome is aversive, learned helplessness may be "followed by depression" (p. 47). Seligman stated that "what is often passed

off as retardation or an IQ deficit may be the result of learned helplessness. . . . Intelligence, no matter how high, cannot manifest itself if the child believes that his own actions will have no effect" (p. 154).

Klein, Fencil-Morse, and Seligman (1976) studied learned helplessness and depression. They found that "depressed subjects were more likely than nondepressed subjects to attribute their performance to their abilities rather than to task difficulty when they failed, but not when they succeeded" (p. 513). They observed that an "important difference is that depressed subjects blame themselves before they begin, whereas nondepressed subjects blame themselves after they fail" (p. 515). They recommended that the construct of personal adequacy be added to the learned helplessness model.

Abramson, Seligman, and Teasdale (1978) presented a reformulation of the learned helplessness hypothesis. This model has three dimensions: stability, generality, and locus of control, and was based on attribution theory. "When a person finds he is helpless, he asks why he is helpless. The causal attribution he makes then determines the generality and chronicity of his helplessness deficits as well as his later self-esteem" (p. 50). The authors stated that "universally helpless individuals make external

attributions for failures, whereas personally helpless individuals make internal attributions" (p. 54). And those internal attributions produce lowered self-esteem. Helplessness deficits may occur in specific situations or be more general or global. When helplessness is short-lived it is transient and unstable. When it's long-lived or recurrent it is chronic and stable. Internal, stable and global is the most handicapping. If the original attribution the person has made is faulty, treatment would consist of changing that attribution to external (to raise self-esteem), unstable (to cut deficits short), and specific (to make the deficits less general).

Moyal (1977) found that external "locus of control correlated negatively with self-esteem . . . but it correlated positively with depression" (p. 951) in fifth and sixth grade children. Tesiny, Lefkowitz and Gordon (1980) concluded that "depression and externality, alone and in combination, are negatively related to school achievement" (p. 510).

A number of researchers have used the IAR in their studies of learned helplessness (Brustein, 1978; Diener & Dweck, 1978; Dweck & Reppucci, 1973; Kennelly & Kinley, 1975; Hill, 1980). Brustein (1978) found that helplessness

could not be measured just by using the IAR, thus supporting the multidimensional model. Dweck and Reppucci (1973) reported that persistent fifth graders had higher IAR scores than the helpless students. They found no sex differences. Persistent students made effort attributions significantly more often than the helpless (Dweck, 1975).

Diener and Dweck (1978) found that their two groups, helpless and mastery-oriented, had significantly different performances following failure. The mastery-oriented children who attributed failure to a lack of effort used significantly more effective strategies than the helpless children who did not attribute failure to lack of effort. Hill (1980) found that learning disabled (LD) boys did not take credit for success, but the non-LD boys did. The implication that the LD boys did not recognize that their actions were connected to their successes signified one symptom of learned helplessness.

Dweck (1976) stated that whether the child makes stable or unstable attributions effects the capability of the child to cope with failure. Dweck and Bush (1976) found a significant difference between fourth and fifth grade boys and girls, with girls more likely having learned helplessness. Dweck, Davidson, Nelson, and Enna (1978) then discovered it was not the sex of the child but the

kind of evaluative feedback the child received that promoted learned helplessness. Dweck and Goetz (1978) consolidated the findings from previous research and postulated that attributions did mediate the effects of prior experiences and also mediated "the generalization of prior failure experiences to new situations" (p. 170). Dweck and Goetz asserted that sex differences in which have been found (e.g. in math) might be explained by the different feedback boys and girls received and thus the different attributions boys and girls made, since attributions influence expectancies of success.

. Attribution Theory

In the process of generating a general theory of motivation Bernard Weiner (1979) brought together the various theories advanced by a considerable body of research (see Chapter II for an in-depth review of the literature). He revised his earlier attributional model to incorporate those findings. Attribution theorists believe that people seek to put meaning to the things which happen to them by finding causes. Whether these causal attributions are verbalized or not, the kinds of attributions made for success and failure influence subsequent behavior.

Weiner identified three primary dimensions of causality; stability, locus (of causality), and control. The dimension of stability (stable vs. unstable) is primarily linked with expectancy of success, the magnitude of the expectancy shift, and performance intensity. Causal stability has a secondary association of affect, especially depression-type affects. "Since ability is stable and not subject to volitional control, ascription of nonattainment of a goal to low ability results in giving up and the cessation of goal-oriented behavior" (p. 11) or learned helplessness.

Weiner conceived of the locus dimension as a backward looking belief. Internal-external locus is linked to esteem-related affects and to persistence. Weiner suggested that the "central self-esteem emotions that facilitate or impede subsequent achievement performance are dimensionally linked" (p. 14) to an internal locus and he stated that it was "time that closer attention was paid to affective life in the classroom" (p. 15). Weiner insisted on the separation of locus and control.

The control dimension (controllable vs. uncontrollable) is linked to interpersonal judgements such as helping or evaluation, and influences choice. The control dimension

also influences sentiments such as liking and sympathy.

"Surely a teacher will not particularly like a student who does not try, and failure perceived as due to a lack of effort does not elicit sympathy" (p. 17). Weiner preferred the term control rather than intentionality because "intent connotes a desire or want" (p. 6).

Thus under the umbrella of attribution theory coexist the concepts of internal-external locus and learned helplessness. Weiner stated that "it appears that a general theory of motivation is under development that has important implications for the understanding of classroom thought and behavior" (p. 3).

In studies of attribution theory with children it has been found that attributions of failure to lack of effort (internal, unstable, controllable) are positively related to persistence (Andrews & Debus, 1978; Nicholls, 1978b). Students with low expectancy of success attributed failure to lack of ability (Covington & Beery, 1976; McMahan, 1973).

Nicholls (1975) found that expectancies were significantly related to feedback. The ability to understand the relationship between ability and effort on outcomes, high ability-low effort and low ability-high effort, appears to be developmental (Karabenick & Heller, 1976; Kun, 1977; Kun, Parsons, & Ruble, 1974; Nicholls, 1978a, b).

Schultz and Pomerantz (1976) found a positive relationship between internality and achievement motivation. Students who gave internal attributions for success have high self-esteem or self-concept (Ames, 1978; Piers, 1977), high ability (Frieze & Snyder, 1980), and/or high social status (Ames, Ames, & Garrison, 1977). However Bar-Tal and Darom (1979) found that students in Israel gave external attributions for success. They speculated that one reason might be that teachers tend to take credit for their students' successes and blame the students when they fail.

In achievement situations three of the four causal attributions originally proposed (ability, effort, and task difficulty, but not luck) were found to be most commonly given in response to open-ended questioning (Bar-Tal & Darom, 1979; Frieze, 1976; Frieze & Snyder, 1980). Additional attributions found by Frieze and Snyder (1980) were interest, physical factors, mood, others' unstable effort and others' personality, and the least frequently used, luck. Abramson, Seligman, and Teasdale (1978) also thought that there were many other causal factors. Weiner (1979) concurring said whereas "there are a myriad of perceived causes of achievement events. . . . within this list ability and effort appear to be the most salient and general of the causes" (p. 5). Frieze and Snyder (1980)

found that the majority of the elementary students they questioned used effort ascriptions for both success and failure, and ability training far back, was second.

Weiner (1979) proposed a taxonomy of causes of success and failure according to locus, stability, and controllability.

Among the internal causes, ability is stable and uncontrollable, typical effort is stable and controllable; mood, fatigue, and illness are unstable and uncontrollable; and temporary exertion is unstable and controllable. Among the external causes, task difficulty is stable and uncontrollable; teacher bias may be perceived as stable and controllable; luck is unstable and uncontrollable; and unusual help from others is unstable and controllable.
(p. 7)

Weiner acknowledges that "some problems . . . remain unsolved, particularly among the external causes" (p. 7). But factor analysis supports the use of those three dimensions.

Noting the saliency of effort in achievement situations, Andrews and Debus (1978) attempted to modify cognitive attributions of sixth grade boys "who least frequently attributed failure to lack of effort" (p. 158). Both training groups significantly increased their attributions of effort and scored significantly above the control group in persistence.

The findings, therefore, give strong support to the major tenet of the attribution model of achievement motivation, that causal ascriptions influence and perhaps even determine subsequent achievement behaviors. (p. 163)

The success of the treatment in changing the boys' attributions for success and failure to effort is, as the authors suggest, "extremely relevant to all aspects of remedial teaching" (p. 165).

Nicholls (1978) said that "mastery learning appears likely to lead to attribution of failure to lack of effort and, thus, compensating effort" (p. 812). Other researchers (Andrews & Debus, 1978; Dweck, 1975; McMahan, 1973) also recommended the change to effort ascriptions through retraining programs.

It appears that the attribution theory model may prove to be an extremely useful method of determining and describing motivation variables and their effect on academic achievement. This theory of motivation based on causal attributions provides a much needed structure on which to base further research.

Statement of the Problem

Some children succeed and others fail who apparently have the same capacity to succeed. Although IQ is the best predictor of academic success, IQ certainly doesn't explain

why some seemingly able students fail. Some mildly handicapped students who have the basic skills needed to succeed, do succeed in regular classes with resource help. Others, just as able, do not. Thus ability is not the only variable influencing academic success or failure. Motivation variables may supply the balance, but the affective aspects of successful classroom performance have been difficult to define and measure.

Purpose

The purpose of this study was to determine the relationship between attributional styles and academic success or failure of non-handicapped and learning disabled fourth grade boys and girls. In this way it was hoped to extend the knowledge gained from past research on locus of control, learned helplessness, and causal attributions, from studies done either in regular classes or with mildly handicapped students. It was hoped that an attributional pattern could be identified which might discriminate between those students who perform successfully academically and those who do not.

Null Hypotheses

- Ho₁: There will be no significant differences between the mean grade point averages of children whether they are non-handicapped or learning disabled, boys or girls.
- Ho₂: On the IAR there will be no significant differences between the responses made by successful students and the responses made by unsuccessful students whether they are non-handicapped or learning disabled, boys or girls.
- A. Using a direct method of discriminant analysis the IAR will have no linear discriminating ability to differentiate between successful students and unsuccessful students.
1. Sex will not be a significant predictor variable in conjunction with the IAR.
 2. Condition will not be a significant predictor variable in conjunction with the IAR.

B. Using a stepwise method of discriminant analysis the IAR will have no linear discriminating ability to differentiate between successful students and unsuccessful students.

1. Sex will not be a significant predictor variable in conjunction with the IAR.
2. Condition will not be a significant predictor variable in conjunction with the IAR.

Ho₃: On the ASC there will be no significant differences between the responses made by successful students and the responses made by unsuccessful students whether they are non-handicapped or learning disabled, boys or girls.

A. Using a direct method of discriminant analysis the ASC will have no linear discriminating ability to differentiate between successful students and unsuccessful students.

1. Sex will not be a significant predictor variable in conjunction with the ASC.
 2. Condition will not be a significant predictor variable in conjunction with the ASC.
- B. Using a stepwise method of discriminant analysis the ASC will have no linear discriminating ability to differentiate between successful students and unsuccessful students.
1. Sex will not be a significant predictor variable in conjunction with the ASC.
 2. Condition will not be a significant predictor variable in conjunction with the ASC.

Ho₄: There will be no interaction between the way responses made by successful students, versus those made by unsuccessful students, appear within the three dimensions of the ASC, thus the significant predictor variables will be situationally located the same, or as reflections, in both parts of each dimension.

CHAPTER II

REVIEW OF THE LITERATURE

Three concepts are addressed in this dissertation. The first two, locus of control and learned helplessness, will be reviewed as separate entities before being subsumed under the larger construct, attribution theory. In each of the three sections the theory will be delineated first, followed by a review of the related research literature.

Locus of Control

Theory

The locus of control concept grew from Rotter's social learning theory which was first published in 1954. Rotter (1966) described the development of the internal-external variable. Rotter explained that "social learning theory . . . provides the general theoretical background for this conception of the nature and effects of reinforcement" (p. 2).

If a person perceives a reinforcement as contingent upon his own behavior, then the occurrence of either a positive or negative reinforcement will strengthen or weaken potential for that behavior to recur in the same or similar situation. If he sees the reinforcement as being outside his own

control or not contingent, that is depending upon chance, fate, powerful others, or unpredictable, then the preceding behavior is less likely to be strengthened or weakened Learning under skill conditions is different from learning under chance conditions. (p. 5)

In a later publication, Rotter, Chance, and Phares (1972) introduced social learning theory "as an attempt to account for human behavior in relatively complex social situations. . . . It . . . utilizes both an expectancy construct and an empirical law of effect" (p. 1). Rotter and associates caution "as in the case with any theory, this one is expected ultimately to yield to a better, more comprehensive theory than has been available in the past" (p. 1). They outlined basic assumptions and the concepts of "behavior potential, expectancy, reinforcement value, and the psychological situation" (p. 11).

Both expectancy and the value of a reinforcement influence behavior. "The success or failure of a specific behavior may have effects on many other behaviors that are seen by the individual as leading to the same goal" (p. 118). Because expectancies generalize to new situations meaningful predictions can be made, especially if the style (internal or external) or quality of the generalizations are known. "The effects of reinforcement are quite different depending upon whether the individual perceives such reinforcement as dependent upon his own efforts or upon factors beyond his

control" (p. 123). Recognizing that the relationship between reinforcement value and expectancy may be positive, negative, or zero, "in specific situations the level of expectancy or the value of the reinforcement may in itself be a cue that determines the quantity of the other variable to some extent" (p. 125).

Rotter (1975) discussed some problems and misconceptions related to the construct of internal versus external control of reinforcement. Generalized expectancies vary according to the construct the theorist employs, and cannot be precisely measured. While they are important personality characteristics and allow "broad predictions from limited data" (p. 59) generalized expectancies "represent only one of many variables . . . and their relative importance is a function of the novelty and/or ambiguity of the situation" (p. 59). The conceptual problem Rotter saw most often was

the failure to treat reinforcement value as a separate variable. To make a locus of control prediction, one must either control reinforcement value or measure it, and systematically take it into account. (p. 59)

Rotter continued with a comment on the fallacy of using a general measure (i.e. his I-E scale) to predict achievement in a specific situation. His test was developed to "allow for a low degree of prediction of behavior across a wide range of potential situations" (p. 62). Rotter reminded

researchers to "guard against the assumption that expectancy regarding the control of reinforcement is a behavioral trait and that the prediction of behavior can ignore the value of the reinforcement that is the expected outcome of the behavior being studied" (p. 66).

Phares (1978) presented an overview of locus of control. He said that reinforcement by itself was not sufficient to increase behavior potential. "The individual must also believe that there is a causal relationship between what one does and what follows" (p. 264). Locus of control is not an either one or the other dichotomy, it is a situationally based continuum, and "only one entry in a very complex formula for the prediction of behavior" (p. 266). Uncontrollability causes reduced learning because generalizations decrease and experience is not used. Phares categorized the I-E scale as a generalized expectancy measure. He noted that the IAR has been used often as a measure of locus of control and "in children, internals show greater school achievement than do externals" (p. 283). Relationships between I-E and achievement need (nAch) are low. They appear to be confounded by sex differences and the nAch measures themselves. Internal control appears to be developmental but "certainly what is important is not

age itself but what age reflects in the way of present circumstances, prior learning, and so on" (p. 292).

Lawrence and Winschel (1975) described some of the implications the locus of control concept might have for special education. They contended that

internality in locus of control must become a conscious goal in the education of handicapped children. This objective is both necessary to normalization and prerequisite to the successful, long term mainstreaming of recently segregated children. If handicapped children are to be educated within regular school programs, educators must maximize those intellectual and personal attributes which will facilitate their acceptance by age peers and increase their potential for academic success. (p. 484)

They recommended that, before mainstreaming mildly retarded children, each child should "demonstrate a level of internality (both for success and failure) not less than average for the class to which he would be assigned" (p. 488).

This would require regular classroom teachers and special education teachers alike to have the background necessary to utilize the child's locus of control beliefs in order to maximize his progress and to consciously promote the acquisition of internal beliefs. "Praise must be deserved; failure must be possible" (p. 489). Lawrence and Winschel strongly suggest that locus of control is one theory which can and should be meaningfully and successfully translated into educational practice.

Measures of Locus of Control in Children

MacDonald (1973), and Phares (1976), and Gilmor (1978) are just three of many who have reviewed the literature and measures of locus of control in particular. Gilmor's review focuses on the developmental aspects of locus of control and includes detailed descriptions of nine instruments measuring locus of control in children. Rotter (1975) said "the most comprehensive and recent review and analysis of the locus of control literature is in a book recently completed by Phares" (p. 56). MacDonald's work emphasized the measures themselves and included the complete texts of those reviewed following the reference section of his chapter.

MacDonald (1973) commented on the "continuing geometrical progression" (p. 170) of research, and briefly sketched the diverse nature of the literature.

All of the research points to the same conclusion: people are handicapped by external locus of control orientations. The prevailing belief is that it is desirable to change people, especially those who are not doing well in our society, in the direction of internality.
(p. 170)

MacDonald discussed projective and indirect methods and the forced-choice formats. Of the children's scales, MacDonald recommended the Intellectual Achievement Responsibility Questionnaire (IARQ) over the others, noting, however, that "it is relevant only to the academic situation" (p. 179).

MacDonald stated that "the psychometric properties of the scale are quite acceptable" (p. 184). Short forms (20 items) of the IARQ were developed by the authors. "Correlations between the long- and short-form subscales are quite high: $I+ = .90$ and . . . $I- = .91$ " (p. 194) for the third through fifth grade children. The authors of the IARQ also suggested that the short forms "are less affected by social desirability response bias than the longer forms" (p. 198).

Phares (1976) began his discussion of I-E scales for children with the comment that the IAR was "at the present time, the most frequently used measure of I-E in children" (p. 53). He continued:

Its basic utility seems to have been established and marks it as perhaps the most serviceable measure of locus of control beliefs in children in the relatively specific areas of intellectual-academic achievement. (p. 55)

Phares reminded readers that the narrower range of conditions could well increase the IAR's specific predictive utility. "Highly structured situations evoke very strong specific expectancies rather than generalized locus of control expectancies" (p. 158).

Gilmor (1978) acknowledged the problem of comparing tests and the results of the widely varying instruments. Gilmor cited the psychometric properties of the IAR and

eight other measures. Differences in locus of control seemed to be due more to socio-economic status than race, and on most measures "internality has consistently been shown to increase with age" (p. 7). In his discussion of locus of control and adaptive behavior, Gilmor observed that juvenile delinquents, emotionally disturbed children, and handicapped children seemed to have an external locus of control. Children with an internal locus seemed to be less anxious, more able to delay gratification, more creative, more efficient in their use of environmental cues, and higher achievers. Noting that in many studies the I+ and I- subscales of the IAR have shown an unbalanced pattern with one high and the other low, eliciting various interpretations (see following section), Gilmor urged those using the IAR in future investigations to compare children "with balanced internal (high I+, I-) versus balanced external (low I+, I-) IAR scores" (p. 12) in addition to those other children with unbalanced scores. In this manner adaptive versus non-adaptive implications may be more adequately judged. Gilmor found that "measures of parent-child interaction demonstrate that more positive parental child-rearing practices are associated with children who endorse internal beliefs" (p. 17). Modification procedures to enhance internality were more effective when children were allowed

"to experience the contingency between their own behaviour and the subsequent reinforcement" (p. 20).

Intellectual Achievement Responsibility

Questionnaire (IAR)

Because locus of control is a very broad concept, Crandall, Katkovsky, and Crandall (1965) created an instrument which covers the more limited school behaviors of children (grades 3-12) and limits the reinforcing others to peers, parents, and teachers. It is a 34 item forced-choice questionnaire. Here is an example:

When you find it easy to work arithmetic or math problems at school, is it usually a. because the teacher gave you especially easy problems, or b. because you studied your book well before you tried them? (p. 97)

A shorter 20 question version is available for use with third through fifth graders (MacDonald, 1973). Half the items have success or positive stems, the other half failure or negative stems.

It was felt that the dynamics operative in assuming credit for causing good things to happen might be very different from those operative in accepting blame for unpleasant consequences. It is possible that belief in personal responsibility for the two kinds of events may develop at differential rates, or that this may be so for some children but not others. Thus, the IAR was so constructed that, in addition to a total I (internal or self-) responsibility score, separate subscores could be obtained for beliefs in internal responsibility for successes (I+ score) and for

failures (I- score). (Crandall, et al., 1965, p. 94)

Normative data. Crandall, Katkovsky, and Crandall (1965) report means, standard deviations and ranges of IAR scores for the normative sample (see Appendix A). The I+ versus I- correlation coefficient for fourth grade was .11, raising "the possibility that self-responsibility for successes and failures may be learned separately, and the young child may assume more responsibility for the one than for the other" (p. 102).

The low correlations between the two subscales raises some doubt about the use of the total I score alone. Since this score combines self-responsibility for success and failure, it may mask important differences between the two in the individual child. (p. 101)

At the fourth grade level there were no significant sex differences in IAR scores. Girls scored slightly higher than boys on Total I and I+, and boys scored slightly higher than girls on I-.

Grades 3, 4, and 5 were grouped for the correlations between IQ and social status. The IAR scores related only moderately to IQ (Lorge-Thorndike, N = 233, Mean 103.0, SD 12.51) but only the I+ scores, small but significant correlated with social class.

Achievement test scores and report card grade averages correlated positively and significantly with the Total I

scores of grades, 3, 4, and 5. However there were some sex differences between the subscales. I+ scores for girls in grades 3 and 4 were highly related to achievement and grades while fifth grade boys' achievement and grades related highly to I- scores (p. 107). "The scale, then, predicts differently for the two sexes at different age levels" (p. 108).

McGhee and Crandall (1968) gave an additional report on the normative results. This time the IAR scores were dichotomized by splitting them at the median score. Girls in grades 3 and 5 with high Total I scores "had significantly higher math and language scores, while those scores were not significantly different for high- and low-internal girls in grade 4" (p. 97). Fifth grade girls who had high I- scores had significantly higher language achievement scores. "There were no significant interactions of grade level X IAR scores for boys" (p. 97). With the three grades collapsed, high internal girls consistently scored higher on all achievement tests. There was no significant relationship between achievement and I+ scores for boys, however high I- boys did better in reading. There was a significant correlation between high Total I boys and all achievement test scores.

Fourth Grade Studies

Researchers have used the IAR extensively in their studies with fourth grade children. Some have dichotomized the scores into internal-external groups by splitting them at the median score (DuCette, Wolk, & Friedman, 1972; McGhee & Crandall, 1968; Messer, 1972; Midlarsky & McKnight, 1980). Others have trichotomized their subjects into high, middle and low internal groups (Arlin, 1975; Howie, 1975; Morris & Messer, 1978). Taub and Dollinger (1975) omitted about 25% of the subjects in their study by eliminating those who earned the upper score and the lower score in the mid group range in order to set their three groups apart. Most researchers simply use the scores obtained on the I+ and I- subtests plus the Total I scores (Brady, Figuerres, Felker, & Garrison, 1978; Brady, Rickards, & Felker, 1975; Chapman & Boersma, 1979; Felker & Bahlke, 1970; Felker & Thomas, 1971; Lifshitz, 1973; McGhee & Crandall, 1968; Messer, 1972; Reed, 1970; Stanwyck & Felker, 1971; Wood, 1978).

Because of the variation in utilization of the obtained IAR plus, minus and total results it is difficult to compare studies. Were the results based on group means? Or were the scores partitioned? Would this make a practical difference in the results? Besides the varying sample sizes, perhaps this is a contributing factor in the variance

in reported results showing (or not showing) effects due to grade, age, or sex.

Research limited to fourth grade subjects. Of studies done using only fourth grade students, one examines the relationship between internal locus of control and academic performance. Messer (1972) divided the IAR scores at the median to get high and low internal groups. Boys who were high I+ and girls who were high I- had significantly higher report card grades. The same was true of achievement test scores, but this reached significance only for boys. "Boys who took credit for their academic successes and girls who accepted blame for their failures were those most likely to have higher grades and higher achievement test scores" (p. 1456).

In studies of fourth grade children correlating internal locus of control with self-concept the girls had a positive correlation between I+ and self-concept while there was a negative correlation for the boys between I- and self-concept (Felker & Bahlke, 1970; Felker & Thomas, 1971). Felker and Bahlke (1970) reported that boys' "high self-concept and denying responsibility for 'bad' happenings were associated" (p. 7). The following year (1971) Felker and Thomas found the same sex difference between I+ and I- scores and self-concept. This time both boys and girls had a

significant positive correlation between self-concept and I+ but only for the boys was the correlation between I- and self-concept significant. They said "these findings suggest sex differences in the development of locus of control as a means of maintaining or enhancing self-concept" (p. 1286).

Brady, Rickards, and Felker (1975) found that girls scored significantly higher than boys on the Total I and I- parts. The girls' mean I+ was higher too, even though it didn't reach significance.

Frierson (1975) divided his fourth grade group by socio-economic status (High SES vs. Low SES), conceptual tempo (reflective vs. impulsive) and fast accurate or slow accurate. Group means and standard deviations of the Total I scores between High SES (Mean 23.86, SD 3.92) and Low SES (Mean 21.79, SD 3.66) were not significantly different. This supports the contention that "social class . . . accounts for only a very small portion of the variance in IAR scores" (Crandall, et al., 1965, p. 104).

Fourth grade plus other grade levels. Solomon, Houlihan, and Parelus (1969) studied black and white 4th and 6th grade boys and girls. There were no significant effects for race. However significant effects for sex were produced because girls scored higher than boys on the I+ and Total I sections. There was "a Sex X Grade X Class

interaction affecting I+ within the white sample" (p. 482) who were lower class children: Girls scored significantly higher than boys in sixth grade while in the fourth grade, boys scored higher than girls.

Stanwyck and Felker (1971) found that "pupils with low self concept gradually assume less responsibility for school successes" (p. 13). No grade effect between 3 and 6 was found.

Barnett and Kaiser (1978) trichotomized the IAR scores in their sample of 4th, 6th, and 8th graders. "Only in the Lo Total I group did the boys attribute more responsibility to themselves for intellectual-academic successes . . . than their failures" (p. 212). These boys also "had significantly lower report card grade averages . . . lower achievement test percentile scores . . . and lower IQ scores . . . than the boys in the Mid and Hi levels of Total I" (p. 212). The boys in the Mid and Hi levels and the girls had no significant differences between any of the IAR scores and performance scores. Also "no main or interaction effects involving grade level were found" (p. 212).

In a previous study, Arlin (1975) also found "no main effects or interactive effects due to grade level" (p. 283). Internal (high IAR) students expressed more favorable attitudes toward teachers and school learning processes. "There

was no difference between internals and externals in the traditional setting" (p. 283) but internals had "a greater feeling of freedom about learning" (p. 283) and "were more satisfied with their teachers" (p. 284) in open settings.

Negative correlations were obtained for I- scores for boys and I+ and I- scores for girls when teachers encouraged students to praise other students (Brady, Figuerres, Felker, & Garrison, 1978, p. 436). Reimanis (1973) found that I+ scores predicted achievement for fourth grade boys and Total I predicted achievement for fourth grade girls. Lifshitz (1973) found no significant sex differences in his study of an Israeli kibbutz, but he did note that all the IAR scores seemed to increase with age.

Midlarsky and McKnight (1980) investigated the effects of achievement, feedback, and locus of control on children's expectations. They found that "internals expected a significantly greater degree of success on Task 2 than did externals" (p. 208). There was also a significant interaction between locus of control and feedback.

Taub and Dollinger (1975) trichotomized the IAR scores of fourth and fifth grade students. They found that medium internals improved under reward and purpose versus reward - no purpose and no reward - no purpose conditions. Externals improved under reward - purpose versus no reward - no

purpose conditions and either reward or purpose versus no reward - no purpose conditions. Greater task performance was associated with higher internality only when no incentive was provided. Thus Taub and Dollinger suggest that Lefcourt's 1967 "observation that cue explication is needed by externals but not internals" (p. 191) is supported. They followed up with another study. This time Dollinger and Taub (1977) explored "the interactive effect of locus of control and purposive cue explication" (p. 120) with students in grades 4, 5, and 6. Again they divided the IAR scores into thirds. "A significant Locus of Control X Sex interaction . . . reflected the low performance of external boys" (p. 122). "Only the performance of externals was significantly greater under purpose" (p. 122) conditions. They conclude that "purpose enhanced the motivation of externals but not internals" (p. 123-124) and recommended further research on cue explication and intrinsic-extrinsic motivation.

Elementary Boys, grades 4-6. Studies done with black and white boys in elementary school (Baron, Cowan, Ganz, & MacDonald, 1974; DuCette, Wolk, & Friedman, 1972; Katz, Cole, & Baron, 1976) found no significant race differences. Katz, Cole and Baron (1976) in reporting their findings said "in general this study found more similarities than differences

between black and white pupils on various motivational measures" (p. 373). DuCette, Wolk, and Friedman (1972) found that "internals gave more creative responses than externals and were more efficient" (p. 298). In another study (Baron, et al., 1974) significant interactions were found indicating that internal boys performed better with intrinsic feedback and that verbally administered extrinsic feedback improved the performance of external boys. Morris and Messer (1978) also found that external boys improved their task performance with external reinforcement. In their study, internals did equally well in both external and internal reinforcing conditions. Bryant (1974) found that "Internal students responded more reliably than External students" (p. 1311). Significantly high correlations between I- scores and achievement test scores in vocabulary, reading comprehension, and language skills and grade point average were reported by Kennelly and Kinley (1975). They found that the Total I scores of the 6th grade boys correlated significantly with all measures of academic performance.

Boys and Girls, Grades 3, 5, and 6

Hollis and Woods (1975) had an opposite finding for younger boys in that "only the I+ subscale was predictive of achievement performance for boys while both the I+ and I-

subscales were equally predictive for girls" (p. 6). Wood (1978) wrote that "among third graders, correlations between IAR Total score and achievement were positive and statistically significant" (p. 8). However he found that for fifth graders, only in the open school, not the traditional school, were the correlations between the Total I and achievement scores significant.

Fifth grade boys and girls. Wright and DuCette (1976) confirm this finding saying "locus of control was able to predict achievement only in the open setting" (p. 9). They found no sex differences. In another study all IAR scores were related to achievement for boys but only the I+ scores were related to achievement for girls (Solomon, Houlihan, Busse, & Parelius, 1971). LaVoie and Adams (1975) wrote

a general conclusion emerging from much of this research is that measures of locus of control predict best those behaviors with motivational determinants (i.e. grades in school), but locus of control is a relatively poor predictor of measures of knowledge (i.e. achievement test scores). (p. 6)

In their study of fifth graders they found IQ to be the best predictor. Looking at the effect of locus of control on intelligence test scores, Bauer (1975) found that internals did better than external boys. "Low-achievement motivation and a relief in external control were predictive of academic cheating among girls but not among boys" (Johnson & Gormly,

1972, p. 324). In a study made of black and white fifth graders (Burbach & Bridgemen, 1976) both black and white girls had a low significant correlation between their I+ scores and self-esteem. Black males' self-esteem was related to Total I and more strongly to their I+ scores. White males' Total I scores also were related to self-esteem, but for them I-, rather than I+, was related.

In two doctoral dissertations (Johnson, 1976; Vogel, 1976) Total I scores were predictive of achievement. Neither one found any significant relationship between the scores of boys and girls. "It would appear that the effects of locus of control on achievement are the same for both sexes, various level of intelligence, and different socio-economic levels" (Vogel, 1976). Seidner, Lewis, Sherwin, and Troll (1978) also using Total I scores found "no significant differences between pupils in open-space and conventional settings" (p. 213). Students with high peer status had greater Total Ability and Quantitative Ability if they were external (Horne, Seidner, & Harasymiw, 1978). Just the opposite was true of low peer status students. Piers (1977) investigating self-esteem and locus of control in grades six and ten found significant interactions between self-esteem and sex with high self-esteem girls having higher I+ scores than girls with low self-esteem. All

children with high self-esteem had significantly higher I+ and Total I scores. A significant grade effect was also found with all IAR scores increasing from 6th to 10th grade.

Secondary School Boys and Girls

Powell (1971) found that 8th grade girls scored higher on I- and got better grades than 8th grade boys. Lowden (1979) said "the combination of the variables sex and total locus of control were significant for estimating . . . overall grade point average and grades in math and English" (p. 6206-A) but locus of control scores were not significantly related to achievement scores. Ninth grade students were surveyed by Entwisle and Greenberger (1972) who found "sex was not a significant source of variance for children of relatively low socio-economic level of either race" (p. 218). There was a difference between middle class white boys and girls with boys scoring higher on the I+ scale. Ninth grade internal boys had significantly higher grade point averages (Schultz & Pomerantz, 1976). They also reported that there was a significant relationship between locus of control and achievement motivation. Bradley and Gaa (1977) tested 10th grade students and showed that "goal-setting students scored significantly higher than non-goal setting students on the IAR+ and IAR- scales" (p. 21).

Handicapped Children

Two studies showed that learning disabled (LD) third and sixth graders scored significantly lower on the I+ sub-scale than their non-LD classmates (Chapman & Boersma, 1979; Hill, 1980), but there were no significant differences between the two groups on the I- scale. Chan and Keogh (1974) studying educable mentally retarded (EMR) and normally achieving third graders matched on mental ages, obtained the same results on the I+ scale. However these two groups differed on the I- scale with the EMR children higher than the others. "No significant difference was found between the groups for Total I scores" (p. 176-177).

Jones and McGhee (1972) used the IAR in a study of institutionalized blind males. There was a significant negative correlation of I+ scores with achievement test scores in science, reading, and social science. The correlation between the listening achievement test score and I- was positive. There were no significant correlations with grades.

Shipe (1971) studied two groups of young men, an occupational training school group (institutionalized retardates, mean IQ 64.7) and a vocational school group (mean IQ 72.7). For the institutional group "low but significant correlations were found between IAR scores,

Porteus Mazes test ages, and institutional wage level" (p. 15). There was a significant positive correlation between locus of control and all achievement scores for the vocational school boys.

In two studies of learning disabled (LD) adolescents, selective attention was investigated (Hallahan, Gajar, Cohen, Tarver, 1978; Tarver, Hallahan, Cohen, & Kauffman, 1977). In the earlier study (Tarver, et al., 1977) a significant negative correlation was found between the Total I scores and the central recall scores of the LD boys (N = 14). The authors speculate that "the internal control mechanisms of learning disabled boys may be unreliable; thus, external control would be a more reality-based means of control" (p. 499). In a second study (Hallahan, et al., 1978) the LD students (N = 24 boys, 4 girls) were matched with normal subjects. The LD adolescents were significantly more external than the normal group. But the surprise was that this time it wasn't the LD teenagers but the normal students who had the significant negative correlation between internal locus of control and central recall. But the two studies are not really comparable because of age and sex differences of the two LD groups. Bendell, Tollefson and Fine (1980) had a larger group (N = 50) of 13 to 15 year old LD boys selected to form an internal treatment group and

an external treatment group. Each boy received both a highly structured reinforcement learning method and a lowly structured reinforcement learning method. There was a significant interaction effect which showed that "adolescents with external locus of control orientation performed significantly better with the highly structured treatment, while adolescents with internal locus of control performed significantly better with lowly structured treatment" (p. 86). The authors suggest that "these findings have important implications for the education of learning-disabled adolescents and point to a need for special education to consider affective factors" (p. 86). A small group (N = 16) of learning and behavior disordered children partially confirmed those findings in that the internal subjects did perform significantly better in the self-select reward condition versus teacher-select reward condition, but external children showed no preference (Raschke, 1979).

Studies Using a Modified Form of the IAR

Lifshitz and Ramot (1978) modified the IAR so as to be more appropriate for their study of Israeli kibbutz adolescents. No significant main or interacting effects were found for age or for sex. There were significant differences among kibbutz movements and between familial and communal sleeping arrangements.

Arlin and Whitley (1978) used a shortened (18 item) form of the IAR with 5th, 6th, and 7th grade students in one school with individualized classes and in another with traditional classes. The results showed that "the perception of self-management of learning was causally prior to perception of academic locus of control" (p. 990).

The IAR Short Form (20 questions) was used with a 3rd grade group (Nyce, Brannigan, & Duchnowski, 1977). "Low-approval motivation/external Ss made significantly more errors than the high-approval motivation/internal Ss" (p. 80), and girls made significantly more errors than boys.

Peterson and Janicki (1979) have also used the short form in their investigation of aptitude-treatment interactions in learning in large or small groups. There were several curious findings. "High-ability students retained more in the small group approach . . . and low-ability students retained more in the large group approach" (p. 684). Also it was found that initial preferences by those 4th, 5th, and 6th graders for large or small groups were diametrically opposed to the actual outcome. Students who initially

said they preferred learning in a small-group approach actually did worse on the delayed test in that approach and better in the large-group approach. Students who said they preferred a

large-group approach actually did worse in that approach and better in the small group approach. (p. 686)

Locus of control was related to "students' attitudes toward math. Internal students tended to have a negative attitude toward math, and external students had a positive attitude" (p. 684).

Learned Helplessness

Theory

Seligman (1975) presented a hypothesis in which he attempted to explain learned helplessness and its effects. Organisms which are subjected to uncontrollable events exhibit deficits because they have learned that nothing they do makes a difference. These deficits include reduced motivation to respond which in turn interferes with instrumental learning where the subjects are able to control outcomes. In addition, even when the subject can control the outcome and makes a successful response his negative cognitive set hinders "learning, perceiving, and believing that the response worked" (p. 22), and so "produces cognitive distortions" (p. 74). The final deficit is emotional disturbance. Learned helplessness, when the outcome is aversive, produces "heightened anxiety, followed by depression" (p. 47). "There is a wide variety of disruption to

behavior, cognition, and emotion that is a consequence of uncontrollability: dogs, rats, and men become passive in the face of trauma, they cannot solve easy discrimination problems, and they form stomach ulcers" (p. 20).

Seligman said, "What is often passed off as retardation or an IQ deficit may be the result of learned helplessness. . . . Intelligence, no matter how high, cannot manifest itself if the child believes that his own actions will have no effect" (p. 154). If indeed the child learns that the responses he makes in school have no effect on the outcomes he experiences, he will lose what motivation he had to begin with. Since he does not perceive any success he may have as due to his own efforts, the child needs to be taught how to cope with some failure in order to reverse classroom helplessness. "In summary, helplessness is a disaster for organisms capable of learning that they are helpless. Three types of disruption are caused by uncontrollability in the laboratory: the motivation to respond is sapped, the ability to perceive success is undermined, and emotionality is heightened" (p. 44).

Hiroto (1974) replicated the studies done with dogs using a loud tone, instead of electric shock, with internal and external college students. Hiroto noted that people

with an external locus of control also believe that their behavior has no effect on outcomes.

The concept of control is central to both helplessness and internal-external studies, but the definitions of the term differ. In helplessness, control refers to E actually arranging the events as independent of responding; while internal-external construct studies refer to perceptions of actual events. (p. 188)

The human subjects responded to the treatments in the same manner animals had. Hiroto also found that external locus of control "interacted with inescapability to produce greater impairment than internal control Ss" (p. 192). Hiroto suggested that the common factor between helplessness and externality is the expectancy that responding and reinforcement are independent.

Hiroto and Seligman (1975) extended Hiroto's 1974 findings by demonstrating that "learned helplessness can be produced within cognitive tasks" (p. 325). They also found cross-model helplessness. "The process engendered debilitates performance well beyond the condition under which helplessness is first trained" (p. 327). Since helplessness generalized to other conditions the authors suggested that learned helplessness might be an induced "trait."

Maier and Seligman (1976) reviewed the research and proposed this helplessness theory. "The expectation that

an outcome is independent of responding (a) reduces the motivation to control that outcome and (b) interferes with learning that responding controls the outcome" (p. 19) plus (c) causing changes in emotionality. They reviewed the alternative theories in motivation and motor accounts. That research was conducted mostly within an S-R framework. Maier and Seligman believed "cognitive theorizing to be more fruitful and to reflect more accurately those processes that we feel to be reflected in behavior" (p. 41).

Klein, Fencil-Morse, and Seligman (1976) studied learned helplessness, depression and the attribution of failure in college students assigned to depressed and non-depressed groups according to their scores on the Beck Depression Inventory. Then they were assigned to one of five treatments within their group (solvable problems, control, unsolvable problems, unsolvable problems with internal attribution of failure instructions, and unsolvable problems with external attribution of failure instructions). If depressed students were given an external reason for their prior failure they did as well on the anagram task as nondepressed students. When they didn't do the treatment task prior to the anagram task, or when they were given solvable problems depressed students did significantly worse than nondepressed students. Attributions given prior

to the task made no difference to the nondepressed students "however the deficits depressed students typically showed were eliminated if they were instructed that their prior failure was due to the difficulty of the problems and not to their own incompetence" (p. 512). "Depressed subjects were more likely than nondepressed subjects to attribute their performance to their abilities rather than to task difficulty when they failed, but not when they succeeded" (p. 513). The authors observe that "the important difference is that depressed subjects blame themselves before they begin, whereas nondepressed subjects blame themselves after they fail" (p. 515), and recommend that the construct of personal adequacy be added to the learned helplessness model.

Tennen and Eller (1977) investigated learned helplessness from an attributional viewpoint. They used college students in "a design similar to that used by Hiroto and Seligman (1975) . . . with the addition of both single and double helpless groups" (p. 266) and with pretreatment and an anagrams task. The double helpless (DH) easier group was told that each new set of unsolvable problems was easier than the last. The double helpless (DH) harder group was told that the unsolvable problems got progressively harder. The DH easier group took significantly longer to solve the

anagrams than the DH harder group. And the DH harder group solved significantly more anagrams than the DH easier or control groups. The attributional cues therefore made a difference in performance since those who were told the unsolvable problems were difficult redoubled their efforts and the efforts of those who were told the problems were easy decreased. The results demonstrated that in this case uncontrollable events plus the attribution of failure to lack of ability did produce cognitive deficits in those students.

Reformulated model. Because some of Seligman's theories were inadequate in explaining human behavior, Abramson, Seligman, and Teasdale (1978) presented a reformulation of the learned helplessness hypothesis. They added the universal versus personal dimension. "Universally helpless individuals make external attributions for failures, whereas personally helpless individuals make internal attributions" (p. 54). Uncontrollability is not synonymous with failure. They point out that "failure is a subset of uncontrollability involving bad outcomes . . . so the notion of uncontrollability means more than just failure, and it makes predictions concerning both failure and non-contingent success" (p. 54). Both universal and personal helplessness cause motivational and cognitive deficits,

however "lowered self-esteem occurs only in personal helplessness" (p. 55).

Helplessness may also include the attributional dimensions of stability and generality. Global helplessness deficits occur in a broad range of situations. Specific deficits occur in a narrow range of situations. When the time course of helplessness is long or recurrent it is called chronic and stable. When helplessness is short-lived and nonrecurrent it is transient and unstable. The dimension of stability is thought to be orthogonal to internality and externality. "The four internal attributions will produce self-esteem deficits; the four external attributions will not" (p. 58).

The authors differentiate between the attribution and expectancy concepts saying "the attribution merely predicts the recurrence of the expectations but the expectation determines the occurrence of the helplessness deficits" (p. 59). The attributions a person makes may be changed by new experiences but "if the expectation is present, then helplessness deficits must occur" (p. 59).

Research has shown that success experiences can reverse and prevent helplessness. The authors suggest that "success does not have its effect by shifting attribution along the internal-external dimension but . . . along the

global-specific dimension" (p. 61). They add that "in the absence of knowledge about individual attributions, the reformulated helplessness hypothesis cannot make clear-cut predictions about expectancy changes and helplessness, since belief in response-outcome dependence or independence is orthogonal to stable-unstable" (p. 63). In other words the internal-external dimension still plays a part in behavior.

In their discussion of the reformulated helplessness model of depression they begin by saying "we believe the affective changes result from the expectation that bad outcomes will occur, not from their expected uncontrollability" (p. 65). They argue that uncontrollable good outcomes don't upset people. "Intensity of affect (and self-esteem deficits) increases with desirability of the unobtainable outcome or with the aversiveness of the unavoidable outcome, and with the strength or certainty of the expectation of uncontrollability" (p. 65). Other factors may include the universal or personal and internal or external constructs. Research findings "suggest that depressives often make internal, global, and stable attributions for failure and may make external, specific, and perhaps less stable attributions for their success" (p. 67). Depression may be chronic or transient, global or specific according to "the stability and globality of the attribution a depressed

person makes for his helplessness" (p. 67). If the original attribution the person had made is faulty, treatment would consist of changing that attribution to external (to raise self-esteem), unstable (to cut deficits short), and specific (to make the deficits less general).

Seligman, Abramson, Semmel, and Von Baeyer (1979) continued with the reformulated model by investigating college students' attributional style patterns and depression. The predicted outcomes occurred. "The more depressed the subjects were . . . the greater were their ratings of internality, stability, and globality of causes of bad outcomes" (p. 245). Depressed students attributed good outcomes more to internal stable factors, but these scores were not as strong. A footnote states that this study has been replicated and the results are robust.

Studies of Depression in Children

Moyal (1977) used the helplessness model to "investigate variables in children that have been found to be related to depression in adults" (p. 951). The 5th and 6th grade children were given questionnaires measuring self-esteem, locus of control, stimulus appraisal, and symptoms of depression. Sex or grade did not affect the scores. External "locus of control correlated negatively with self-esteem . . . but it correlated positively with depression

score" (p. 951). "It appears then that in preadolescents, elements of depression are related in a manner similar to that found in adults" (p. 952).

Lefkowitz and Tesiny (1980) describe the psychometric properties of the Peer Nomination Inventory of Depression (PNID), a 20 question scale which includes 13 depression items. Fifth and sixth grade students (492 girls and 452 boys) in ten New York City elementary schools participated in the standardization and cross validation studies. There were no significant sex differences. Children who had higher scores on the 13 depression items in the PNID also had lower achievement scores, self-esteem, and tended to rate themselves as depressed. Also they had an external locus and were absent from school significantly more often. This report was followed by a more detailed description (Tesiny, Lefkowitz, & Gordon, 1980) in which they present the correlational analyses of those relationships. They suggest that only a small number (4-5%) of children may be depressed, making it difficult to obtain high correlations when these variables are measured in large groups of normal children. However they conclude that "the results of the present study clearly indicate that depression and externality, alone and in combination, are negatively related to school achievement" (p. 510).

Studies with Children Which use the IAR

The IAR has been used in studies of learned helplessness in children (Brustein, 1978; Diener & Dweck, 1978; Dweck, 1975; Dweck & Reppucci, 1973; Kennelly & Kinley, 1975). Brustein (1978) found that the IAR was an inadequate instrument with which to measure levels of helplessness in fifth grade children. Kennelly and Kinley (1975) hypothesized that "a major determinant of poor academic performance is learned helplessness produced by teachers, parents and other authority figures who punish the occurrence and the non-occurrence of misbehaviors with equal or near probability" (p. 450) in their study of perceived contingency of teacher administered reinforcements. "Perceptions of the contingency of aversive events but not pleasant events are related to locus of control and academic competence" (p. 452). When sixth grade boys perceived that their teachers would punish them for bad behavior their academic performance was significantly better and they also were more likely to have an internal locus of control.

Three of Carol Dweck's studies have included the IAR questionnaire (Diener & Dweck, 1978; Dweck, 1975; Dweck & Reppucci, 1973). In the first one the I+ stems were subdivided into those attributing success to ability (N = 8) or to effort (N = 9) and the I- stems were also dichotomized

into ability ($N = 7$) and effort ($N = 10$), using all 34 questions (Dweck & Reppucci, 1973). The fifth grade children were identified as helpless or persistent on the basis of their experimental task performances. There was a significant difference between the two groups on the Total I scores. The persistent subjects also had significantly higher scores on the I+ and I- subscales. No sex differences were found. When the ability versus effort stems were examined no significant difference was found between helpless and persistent subjects who attributed their outcomes to ability. There were reliable differences between the two groups on the effort stems in both success and failure conditions. The persistent tended to attribute success to effort and failure to lack of effort, and boys also attributed failure to lack of effort significantly more than girls did.

In Dweck's next study (1975) only the effort stems were utilized, presumably since Dweck and Reppucci (1973) had not found the ability stems to be discriminative. Again Dweck (1975) found that the "difference in the degree to which they attributed outcomes to effort, that is, $(I+_{\text{E}}) + (I-_{\text{E}})$, was highly reliable" (p. 680) with the persistent choosing effort attributions significantly more than the helpless. Then the helpless subjects were randomly

assigned to either an Attribution Retraining (AR) group or Success Only (SO) group. Those in the AR group greatly improved in their ability to cope with failure, became more persistent and learned to seek help when they had difficulty. Those in the SO group "continued to display a marked impairment of performance following failure" (p. 683). Thus teaching helpless children to take more responsibility and to change to effort attributions is a promising way to reverse helplessness.

Diener and Dweck (1978) described two studies in which the fifth grade children were divided into helpless and mastery-oriented groups on the basis of their scores on the ten items in the I- subscale which attributed failure to lack of effort. In Study 1 the children were asked why they thought they had trouble with the problems. In Study 2 the children were asked to do their thinking out loud and their verbalizations were written verbatim. In Study 1, 52% of the helpless children attributed their failure to lack of ability. "In contrast, none of the mastery-oriented children gave this response" (p. 456). The mastery-oriented children gave four other explanations (effort, luck, fairness, task difficulty). There was no difference in ease of training between the two groups. There were "significant differences in the performance of

helpless and mastery-oriented children following failure" (p. 457). The mastery-oriented children who attributed failure to lack of effort used significantly more effective strategies than the helpless children who did not attribute failure to lack of effort. "A similar pattern was obtained in Study 2, in which helpless children, following failure, used illegitimate and disconfirmed hypotheses significantly more than mastery-oriented children" (p. 457). In Study 2 there was a "significant difference in the use of the verbalizations by the helpless and mastery-oriented children" (p. 458). After the first failure problem helpless children verbalized ineffectual task strategies, attributions to loss of ability, statements of negative affect and solution-irrelevant statements. In contrast, the mastery-oriented children's verbalizations consisted of self-instructions, self-monitoring, statements of positive affect and positive prognosis statements. "Instead of searching for a cause for their failure and making attributions, mastery-oriented children seemed to search for a remedy" (p. 459). "Helpless children ruminate about the cause of their failure and, given their attributions to uncontrollable factors, spend little time searching for ways to overcome failure" (p. 460). Diener and Dweck conclude "while most current attribution theories emphasize

individual differences in the nature of the attributions, the present findings suggest that when or whether attributions occur spontaneously may of itself be a critical difference" (p. 460).

Children and Learned Helplessness

Dweck and Bush (1976) investigated the sex differences in learned helplessness. In the first experiment fifth grade children were given failure feedback from an adult female, an adult male, a female peer, and a male peer. The girls made no improvement when failure feedback came from a woman, but when it was given "by a peer, girls showed an immediate and sustained improvement in performance". (p. 152). The results were quite different for boys. The boys showed no improvement when failure feedback came from male peers, while improvement in performance was shown after adult feedback. The children were asked to attribute their failure to one of three causes, either ability, effort, or fairness of examiner (agent). Failure feedback from adult females lead girls to attribute their failure to a lack of ability while boys tended to blame the agent. Again the opposite was found when male peers gave the feedback. In this case girls blamed the agent and boys attributed their failure to a lack of ability. In Experiment 2 these

attribution results were confirmed by a group of 4th and 5th graders. "While girls tended to attribute their failures to lack of ability with adult agents and not peers, boys tended to do so with peer agents and not adults" (p. 154). The authors suggest "moreover, these two 'types' of helplessness (failure attributions to lack of ability for girls and to the agent for boys) have different implications for the generalization of helplessness and performance impairment to new settings" (p. 155). The attribution of lack of ability in an academic area remains stable for the girl year after year, and she doesn't try. The boy, by attributing failure to a specific agent, will be encouraged to try again when he gets a new teacher or moves to a new school.

Dweck, Davidson, Nelson, and Enna (1978) then investigated the way adults used evaluative feedback. One fifth grade class and two fourth grade classes were used in the first study which was "an observational study of teachers' feedback to boys and girls in the classroom" (p. 270). The evaluative feedback, and its absence after the teacher had checked the child's work, was coded for sex of child, positive or negative, and contingent or noncontingent for each of the three female teachers. Of the positive feedback given children, boys received significantly more for

the intellectual quality of their work than girls did. Of the negative feedback on the intellectual quality of performance "less than one third of the boys' negative evaluation was contingent on intellectual aspects of their work, whereas more than two thirds of girls' was directly related to the quality of their performance" (p. 271).

In summary, despite the fact that girls, overall, received more positive and less negative evaluation than boys, both the contingencies of evaluative feedback and explicit attributions made by teachers are ones that were hypothesized to promote attributions characteristic of helplessness in girls, but not in boys. (p. 272)

Fifth grade students were used in the second study to see if teacher behavior really was the reason for the sex differences observed previously. The three experimental conditions "differed with respect to the stated contingencies of the failure feedback" (p. 273). Students in the teacher-boy condition were randomly given five solution-relevant and five solution-irrelevant criticisms. No one in any of the treatment groups was given success feedback. "There were two teacher-girl situations in which failure feedback was addressed specifically to the correctness of the solution" (p. 273). The A group was given five solution-relevant criticisms. The B group received ten. The children were also asked to attribute their failure to

effort, ability, or agent. In the teacher-boy group 80% of the girls and 50% of the boys attributed failure to lack of effort. In the teacher-girl groups both boys and girls attributed their failure to lack of ability.

The results thus demonstrate clearly that regardless of sex, children who receive failure feedback that is solution specific are far more likely to view subsequent feedback from that agent as indicative of ability than are children who receive feedback that is often solution irrelevant. It appears, then, that the pattern of feedback observed in the classroom to distinguish teacher-boy from teacher-girl interactions can have a direct causal effect on children's interpretation of negative evaluation. (p. 274)

The authors suggest that these environmental characteristics promote sex differences by creating conditions which facilitate the learning of helplessness in girls.

Weisz (1979) investigated learned helplessness in educable mentally retarded children and nonretarded children by completely crossing three mental age (MA) levels with three IQ levels and two conditions. The children were given several measures of learned helplessness by a female experimenter three weeks after a male experimenter had administered the learning task. On the response initiation scores there was no significant IQ X MA interaction at the two lower MA levels: Only at the high MA level was the effect of IQ significant. On the children's perceived influence questionnaire "effort attributions for negative

outcomes increased with MA" (p. 315). Teachers rated children as less helpless as their MA increased. Weisz suggests that the retarded children (IQ 70) may be "susceptible to helplessness" (p. 311), adding that it was "only the positive situation . . . that yielded a main effect of IQ and only the positive situation that revealed less response initiation with development" (p. 317).

Attribution Theory and Learned Helplessness

Dweck (1976) discussed the effect of social cues on learned helplessness. These social cues such as the age and sex of the evaluating agent, when combined with the child's previous experience, effect the child's interpretation of evaluative feedback. This hypothesis "explains" why children who have had identical treatment vary so in their attributions of failure outcomes and who react so differently to failure experiences. Whether the child makes stable or unstable attributions effects the capability of the child to cope with failure. Success experiences were not effective in helping the child deal with failure. Dweck concluded "to the extent that we can specify these histories and determine the manner in which social cues interact with them, we can begin to predict children's behavior with increasingly greater accuracy and perhaps to devise ways to facilitate adaptive behavior" (p. 109).

Dweck and Goetz (1978) traced the development of research conducted by Dweck and associates with attributions and learned helplessness between 1973 and 1978. Most of these studies have been described in the preceding pages. Dweck and Goetz observed an intriguing paradox in the development of helplessness in the context of sex differences. Girls are praised by teachers and feel they have little ability. Boys are criticized by teachers and retain a positive self-concept. Nicholls (1975) and Dweck's own research found that feedback did acquire different meanings for the two sexes. To extend this work Dweck and Goetz designed two studies "to investigate the hypothesis that sex differences in attributions mediate the generalization of prior failure experiences to new situations" (p. 170). The first one was a laboratory study. They noted that while boys and girls began with equivalent expectancies, by the end of the fourth trial "boys and girls confronted a new task with the typical sex difference in expectancy" (p. 171). In the second study, children were asked to predict how well they would do on their report cards. Girls did not give higher estimates than boys even though their grades had been significantly higher than boys' previously, suggesting that "failure effects may have more

of a long term and cumulative effect for girls than for boys" (p. 172).

Attribution Theory

Theory

Bernard Weiner and his associates have written extensively in the field of attribution theory the last decade. Ten years ago Weiner and Kukla (1970) reported a series of six experiments applying an attributional analysis to achievement motivation. In Experiment 4 they tested the 3rd through 6th grades in one school with the IAR and the Children's Achievement Scale (CAS). Children above the median on the CAS were classified as high in achievement motivation and those below the median, low. Only the 5th and 6th grade boys showed a significant difference on the I+ subscale with high achievement motivated boys taking more responsibility for success. Fifth grade boys low in achievement motivation scored significantly higher on the I- subscale, taking more responsibility for failure. When Weiner and Kukla examined the IAR stems they found that "beyond the fourth-grade level students low in resultant achievement motivation were more likely to attribute failure to a lack of ability than the high-achievement group" (p. 16). Those results were then tested with college

students, and extended with the addition of a performance task and an effort versus ability rating scale. They postulated that persons high in achievement motivation approach tasks because they ascribe success to their ability, persist longer because they ascribe failure to a lack of effort, and choose tasks of intermediate difficulty because this gives them the greatest amount of information about their ability.

Weiner, Frieze, Kukla, Reed, Rest, and Rosenbaum (1971) published a paper which is a classic reference in attribution literature. They presented an attribution model of achievement motivation "based upon the assumption that beliefs about the causes of success and failure mediate between antecedent stimulus-organism transactions and ensuing achievement behavior" (p. 2). This model was composed of two dimensions, stability and locus of control, and the four causal elements of ability, effort, task difficulty and luck. Weiner et al. suggested that "expectancy shifts are primarily determined by the stability, rather than the locus of control, of the attributional element" (p. 3). They also noted that "moral judgements are linked to the attribution of intentionality, rather than with ability" (p. 3). They reviewed Atkinson's

theory of achievement motivation and reinterpreted it, postulating that antecedent conditions "determine whether success or failure experiences are ascribed to the perceived causal elements of ability, effort, task difficulty or luck" (p. 10) which ascriptions in turn affect the ensuing achievement behavior. Experimental studies they reviewed demonstrated those points. Instead of defining the achievement motive in affective terms such as pride they contend that achievement motive is a cognitive disposition and should be defined as a "capacity for perceiving success as caused by internal factors, particularly effort" (p. 18).

From this seminal work Weiner, Heckhausen, Meyer, and Cook (1972) went on to analyze the role of effort and reanalyze locus of control. They "contended that locus of control influences the affective reactions to an event, with internal ascriptions magnifying emotional responses" (p. 240). Experiment 1 (Cook's dissertation research) examined effort ascriptions and affective reactions in fifth and sixth grade boys. She found that the greater the tendency to attribute success, rather than failure, to effort, the greater the self-reward for success relative to self-punishment for failure" (p. 242). Experiment 2

(from Meyer's dissertation) related expectancy of success and performance intensity to causal ascriptions. German high school boys were given a digit-symbol substitution task and asked to give an attribution for the failure and a probability of success on the next trial. The attribution of lack of ability and difficult task "produces greater decrements in the probability of future success following failure" (p. 245). Experiment 3 investigated the cue function of task difficulty with German teachers. The results confirmed that effort was perceived as most salient at the intermediate task level.

"Attribution theorists investigate the perception of causality, or judgement of why a particular incident occurred. The allocation of responsibility manifestly guides subsequent behavior" (Weiner, 1972, p. 203). Weiner applied attribution theory to the classroom noting that children who have little ability but try hard get rewarded, while those who have the ability but don't try are punished. With that definition the examination of the influence of attributions on teacher-student behavior was introduced. After a recapitulation of his work, Weiner introduced the concept of learned helplessness, saying that "learned helplessness is an appropriate label for the low achievement syndrome, since persons low in achievement motivation do not

perceive that effort influences outcome" (p. 210). Weiner suggested that attributional conflicts between teacher and student may occur because of motivational factors such as differing expectations, self-predictions, and defensiveness. Because attributions have an important effect on achievement striving, Weiner recommended that the attribution process be taught in teacher training programs.

Attributions are also used to provide a "link between achievement and ethical judgement" (Weiner & Peter, 1973, p. 291). Noting that moral judgements among adults are primarily determined by perceived intentions or effort, the judgements of both moral behavior and achievement strivings were investigated. Children aged 4-18 (N = 300) were given an achievement situation and a moral incident to judge. Results showed that children used outcome to judge achievement and intent to judge morality. "Given a situation in which a bad intent results in a positive outcome, the achievement act is rewarded, while the moral act is punished. This differential evaluation increases with development" (p. 306). "The sequence of evaluative stages . . . was identical across racial and sex groupings" (p. 290). The authors suggest that since "trying" is positively rewarded by adults and young children use the concept of intent in

judging moral situations they should be taught to perceive "trying" as a means of achievement.

Building upon a constantly growing body of research, Weiner (1974) recognized the deficiencies in the classification scheme and entertained adding a third dimension, suggested by Rosenbaum in 1972, of intentionality. Free-response data collected by Frieze in 1973 supported the earlier intuitive causal ascriptions since results of the categorization showed that the first four were identical (ability, immediate effort, task difficulty, and luck). Success or failure outcomes sometimes may be attributed to the same causal explanations. Therefore Weiner cautions that "we have found repeatedly that it is unwise to discuss achievement causality without specifying whether we are dealing with the perception of success or of failure" (p. 8). Explaining that previous research on external and internal locus of control and expectancy shifts had been confounded by the stability causal dimension, Weiner stated "investigators have proved definitely that expectancy shifts are unrelated to locus of control, but are related to the stability of the causal dimension" (p. 27). Since expectancy for success may shift after a failure ascribed to a stable factor such as lack of ability, "learned helplessness" may be acquired. This "may have dysfunctional

consequences. On the other hand, attribution of failure to a lack of effort intimates that success is possible. Thus, effort attributions are likely to have adaptive and instrumental effects" (p. 30). Effort attributions also "have a profound influence on affective (evaluative) reactions to success and failure. High effort is always evaluated more positively than low effort" (p. 37).

There are other variables involved with reactions to failure besides causal factors. Level of achievement needs is one such variable. When a person is highly motivated to succeed his "motivation is augmented after failure" (Weiner & Sierad, 1974, p. 140). Research has shown that highly motivated people ascribe failure to lack of effort. This also increases subsequent performance. Those with low achievement needs ascribe failure to a lack of ability with a subsequent decrease in performance. Achievement strivings are indeed "mediated by cognitions pertaining to the causes of success and failure" (p. 146). Thoughts are not byproducts of behavior. Thoughts or "causal beliefs precede and in part determine subsequent action" (p. 150).

Weiner, Nierenberg, and Goldstein (1976) reviewed research studies which "examine the effects of causal stability as well as locus of control on expectancy and expectancy shifts" (p. 57). In a study, again of college

students, varied amounts of success experience and "a new measure of attributions was employed that allowed the causal judgements to be made within a single causal dimension while holding constant the remaining dimension of causality" (p. 60). The correlations obtained were low but significant. Expectancy of future success scores were "directly related to the stability of the perceived cause of the prior positive outcomes" (p. 63). In addition, "both within internal control and within external control expectancy increments are positively associated with the stability of the ascriptions" (p. 64). The authors conclude that "we now consider this relationship to be proved" (p. 65).

In a discussion of achievement strivings, Weiner (1978) noted that "taxonomies of causes have been developed that allow each causal factor to be placed within a multidimensional framework" (p. 19). The cognitive framework provided by attribution theory permits "the conceptual analysis of achievement behavior" (p. 20). Weiner states that "locus of control influences the achievement-related affects of pride and shame, whereas causal stability affects expectancy shifts after success and failure. This theory is able to account for much of the data in the achievement area, as well as broadening the cognitive focus of current theorizing" (p. 30).

The affective consequences of causal ascriptions were described by Weiner, Russell, and Lerman (1978), in a detailed analysis of the relation between attributions and affect. Criticisms of the previously held hypothesis that locus of control influences affect, and stability influences expectancy shifts, were acknowledged. The authors identified self- versus other-perception, affect versus evaluation, and the time course of goals or consequences, as additional factors to be considered "when examining the consequences of causal attributions" (p. 60). Recognizing that there was no empirical evidence linking achievement motivation to a single affective dimension (pride-shame) the authors set out to identify the affects which discriminate each of ten attributions for success and eleven attributions for failure. The results revealed that Weiner needed to revise his attribution model which stated that locus of control influences achievement related affects. They conclude

it appears that affects often (but not necessarily always) are directly tied to the causes, without locus of control serving a mediating role. This creates some theoretical difficulties, for it is quite evident that the internal-external dimension of causality influences a wide array of thoughts and actions. How, then, locus of control should be conceptualized within this attributional approach to motivation remains a problem for the future. (p. 82)

In the study of emotions, attribution theorists would say that cognitive processes determine emotions. This is relevant to the etiology of depression.

In our data, the depression-related labels of hopeless, helpless, and depressed, and related affects such as resigned and aimless, most appear when there is an internal, stable attribution (ability, stable effort, personality, and intrinsic motivation) for failure. (p. 85)

Weiner, Russell, and Lerman conclude that "the investigation reported here demonstrates that there are qualitative differences in feelings as a function of causal ascriptions for success and failure" (p. 87).

A theory of motivation. In the process of generating a general theory of motivation, Weiner (1979) brought together the various theories advanced by the results of a considerable body of research. He revised his earlier attributional model to incorporate those findings. Based upon "a central assumption of attribution theory . . . that the search for understanding is the (or a) basic 'spring of action'" (p. 3), "a theory of motivation based upon attributions of causality for success and failure is offered" (p. 3).

Weiner identified three primary dimensions of causality: stability, locus (of causality), and control. However he did not limit the number of dimensions to those three. Two other dimensions that could be included are intentionality

(intentional vs. unintentional) and globality (global vs. specific).

The dimension of stability (stable vs. unstable) is primarily linked with expectancy of success. "Expectancy shifts after success and failure are dependent upon the perceived stability of the cause of the prior outcome; ascription of an outcome to stable factors produces greater typical shifts in expectancy (increments in expectancy after success and decrements after failure) than do ascriptions to unstable causes" (p. 9). Weiner contends that existent knowledge proves that it is the dimension of stability which determines the magnitude of the expectancy shift. When the dimension of stability was discriminated from the dimension of locus "the disparate causal locus groups did not differ in their expectancies of success" (p. 9). Performance intensity is associated with stability. Causal stability has a secondary association of affect, especially depression-type affects. Learned helplessness has been linked with the stable attribution of lack of ability. "Since ability is stable and not subject to volitional control, ascription of nonattainment of a goal to low ability results in giving up and the cessation of goal-oriented behavior" (p. 11).

Weiner admits that his thinking on locus of causality has changed radically and is still tentative. While "the taxonomic placement of a cause depends upon its subjective meaning . . . there is general agreement when distinguishing causes as internal or external" (p. 6). Weiner conceives of the locus dimension as a backward-looking belief. Esteem-related affects seem to be linked to locus, but in a very complex manner. "It might be anticipated that causal locus is directly linked with many psychological reactions in addition to esteem-related affects" (p. 15). This dimension is also related to persistence. Weiner says "it is time that closer attention was paid to affective life in the classroom" (p. 15). At any rate he contends that "the concepts of locus and control must be separated" (p. 6).

In the control dimension causes are categorized as controllable or uncontrollable. Weiner prefers the term control rather than intentionality because "intent connotes a desire or want" (p. 6). The control dimension is linked to interpersonal judgements: it "centers upon inferences about others and how beliefs about another's responsibility for success and failure influence an actor's reactions toward that person" (p. 15). An attributional analysis of helping behavior shows that help is withheld when failure is seen as controllable. If the cause of an outcome is

perceived to be under a person's control such as amount of effort, it has a great influence on evaluation, especially on how students are graded. The control dimension also influences sentiments such as liking and sympathy. "Surely a teacher will not particularly like a student who does not try, and failure perceived as due to a lack of effort does not elicit sympathy" (p. 17). Choice is one behavior influenced by the dimension of control.

Weiner identified three sources of affect in achievement situations. "First, there are emotions tied directly to the outcome" (p. 14) regardless of the reasons for the outcome. General feelings like "good" or "bad" are initial reactions. "Second . . . are more distinct emotions, such as gratitude or hostility" (p. 14). "Third, the affects that are associated with self-esteem, such as competence, pride, and shame, are mediated by self-ascriptions" (p. 14). Weiner suggests that the "central self-esteem emotions that facilitate or impede subsequent achievement performance are dimensionally linked" (p. 14) to an internal locus.

Attributions are used to preserve the initial self-concept. These may be quite resistant to extinction because "attributions that minimize goal expectancy decrements after nonreward should retard extinction" (p. 11). If the initial self-concept is poor, a very gradual change program should

be implemented in order to alter the perceived causes of failure.

Attribution theory may also be applicable to other areas such as drug treatment of hyperactive children, mastery, and learned helplessness, which are germane to school settings, and farther afield to areas such as parole decisions and loneliness.

Drug treatment appears to take responsibility for hyperactive behavior away from the child which "minimizes self-blame, low self-esteem, and negative evaluation from others a beneficial and unanticipated side effect of the treatment technique" (p. 19). However, if the cause of their hyperactivity is perceived as stable with little possibility of recovery there may be detrimental consequences such as interference with learning new coping behaviors.

Mastery-type behavior has been noted in young children who prefer objects they can manipulate or control presumably because the "self-attribution of outcome increases positive esteem-related affects" (p. 19).

Weiner also described Seligman's work on learned helplessness and quoted from the reformulated model (Abramson et al., 1978). The literature on learned helplessness is reviewed in another section of this chapter.

Weiner concludes saying that "it appears that a general theory of motivation is under development that has important implications for the understanding of classroom thought and behavior" (p. 3).

Studies with Children and Adults

McMahan (1973) studied the relationships between causal attribution and expectancy of success with sixth grade, tenth grade, and college students. No significant sex differences were found. Measures of expectancy of success were given before the anagrams task and following that task students were asked to make attributions for their success or failure. High expectancy for success students attributed failure to lack of effort and bad luck rather than lack of ability. Those with low expectancy of success attributed failure to lack of ability. "Subjects were far more likely to say they had succeeded because the task was easy than to say they had failed because the task was hard" (p. 111). McMahan "suggested that when the dimension of stability is disentangled from the dimension of locus of control, as it is in the four-factor attributional analysis, the stability dimension is the more salient in achievement contexts" (p. 113).

Karabenick and Heller (1976) used first, third, and fifth grade children and college students to assess knowledge of the relationship between ability and effort on outcomes.

Younger children understood that in a low ability-successful outcome condition great effort is needed. However "it was not until fifth grade that ability attributions increased when subjects were told that success was accomplished with low effort" (p. 560). Thus it would seem that there is a developmental aspect in that the ability-to-effort relationship occurs before the effort-to-ability relationship is established.

Kun (1977) studied the "development of inverse compensation between ability and effort" (p. 871) in elementary school and college students. "The stimuli were stories concerning boys' performances on a set of seven puzzles" (p. 863). The students were given information about his level of ability, or his level of effort, and the outcome. Students were asked the level of the missing factor (effort or ability). Results showed that young children believed that a person had equal levels of ability and effort. "Inverse compensation is unequivocally absent in the lower elementary grades, and it appears in effort ascriptions between 8 and 9 years of age" (p. 871).

Kun, Parsons, and Ruble (1974) have been very active attribution researchers. The first article they collaborated on described three studies investigating "developmental changes in the integration of ability and effort information to predict outcome" (p. 721).

Study 1 involved 6, 8, and 10-11 year old boys and girls and college males. The students were given ability and effort data and asked to predict the outcome. Effort was the cue more often used. In Study 2, first, third, and fifth graders replicated the first study except that the order of the cues given, effort and ability, was alternated. In this manner it was found that the "greater effort effect for the six-year-olds in Study 1 can be attributed to 'recency'" (p. 727) but the order of presentation had no influence for the older students. Study 3 involved kindergarten and second graders in a replication of Study 1. The majority of the children used both effort and ability cues. Kun, Parsons, and Ruble conclude "that effort is clearly more important than ability in predicting achievement outcomes for all developmental levels except the youngest" (p. 731-732).

Studies with Children

Ruble, Parsons, and Ross (1976) examined "the development in children of the information-attribution-affect link" (p. 991) in two studies. The first one involved 6, 8, and 10-11 year olds; the second involved 4-5 and 7-9 year olds.

Children's success/failure outcome had a strong and consistent effect on their self-evaluations and facial expressions. . . . The children

perceived themselves as happier and more able, and perceived the task as easier, when they thought they had succeeded than when they thought they had failed. . . . Only ratings of effort were not affected by the outcome information. (p. 995)

Parsons and Ruble (1977) studied the development of achievement-related expectancies in preschool and elementary school children. Expectancies were measured before each trial at a hidden objects puzzle. Older children were increasingly less certain of success. Successful children had higher expectancies than those who failed.

Andrews and Debus (1978) investigated "the differential relation of persistence to attributions . . . on a behavioral measure and two pencil-and-paper measures" (p. 157) of sixth grade boys and girls. They followed up with three treatment groups of boys, selected from Phase 1, "who least frequently attributed failure to lack of effort" (p. 158). In the first study persistence and resistance to extinction was found to be positively related to the attribution of failure to insufficient effort. "Attribution of failure to the stable elements of ability and task difficulty were both negatively related to persistence" (p. 158) and resistance to extinction. In Phase 2 there was "a control group, a social reinforcement group . . . and a token plus social reinforcement group" (p. 158). The boys received individual

training to change to effort ascriptions for failure. Results showed that both training groups "exhibited a greater incidence of effort attribution for failure than did control subjects" (p. 160). The same was true for success. Both training groups scored significantly above the control group in persistence and resistance to extinction. There was no significant difference between training methods.

The findings, therefore, give strong support to the major tenet of the attribution model of achievement motivation, that causal ascriptions influence and perhaps even determine subsequent achievement behaviors. (p. 163)

The success of the treatment in changing the boys' attributions for success and failure to effort is, as the authors suggest, "extremely relevant to all aspects of remedial teaching" (p. 165).

Covington and Beery (1976) used attribution theory in their observations on self-worth and school learning. They state that "the lack of successful experiences and the scarcity of rewards in the classroom can lead some students to learn to expect failure. These students give up and stop trying to succeed" (p. 41). "In these cases, it appears that the students make situational attributions (e.g. luck) for the few successes they might have, and dispositional

attributions for their failures (e.g. poor ability and low self-worth)" (p. 71).

Schultz and Pomerantz (1976) used the IAR to identify internal and external ninth grade boys for their study of achievement needs, academic achievement, and ability-effort attributions. They found a positive correlation between locus of control and achievement motivation. Attribution of success to effort was also strongly related to achievement motivation. However Schultz and Pomerantz noted that "locus of control did not distinguish high need achievers who prefer achievement activities from those who do not" (p. 50).

Piers (1977) studied self-esteem, level of esteem certainty and responsibility for success and failure in sixth and tenth grade students. The children's self-concept and certainty scores on the Piers-Harris Children's Self-Concept Scale, and their IAR scores were used in an analysis of covariance. There was a strong positive relationship between high esteem and I+ scores. Tenth graders also had higher I+ scores. Significant interactions were found between sex and self-esteem with low self-esteem girls getting low I+ scores, and between self-esteem and certainty with high certainty-high esteem students scoring high on the I- and the high certainty-low esteem students getting low I+ scores. High certainty sixth graders got low I- scores.

Tenth graders and girls got high I- scores. Piers advised attribution theory supporters to examine "self-esteem as a motivating variable of some power, whose effects cannot be fully accounted for under their present theory" (p. 303).

In a study of behavioral incongruity and perceived intentions elementary school children were asked to explain discrepant behavior as presented in ten situations (Whiteman, Brook, & Gordon, 1977). The authors found that noncausal responses ("Didn't want it") decreased with grade level while motivational responses increased with age. The motivational responses were divided into instrumental, psychological process, and interpersonal categories. The first two components were used significantly more often than the third. There was a significant interaction between grade and response type. In kindergarten and first grade instrumental responses were given more often than psychological process attributions. This was reversed by fifth and sixth grades.

Bar-Tal and Darom (1979) asked fifth and sixth grade Israeli children "to list all the causes which could have contributed to the received grade" (p. 265). Any cause listed by two or more children was categorized on two dimensions; stable-unstable and internal-external. A factor analysis came up with the same dimensions. There was a significant main effect for sex. Girls "tended to

attribute their outcome to preparation . . . and home conditions" (p. 265). Successful students gave the attributions of ability (boys more than girls), easy material, easy test, teacher's explanations, and home conditions (girls more than boys). These causes were mainly external and stable. "Failure was attributed to insufficient preparation, low ability, lack of effort, difficulty of the subject material, and the difficulty of the test" (p. 265), or mainly internal causes.

Frieze and Snyder (1980) used taped recorded interviews of first, third, and fifth grade students to see how the children explained the causes of success and failure. The achievement situations, involving a white boy, had two versions (success and failure) and were presented with a photograph illustrating that situation. Effort was most often used to explain testing outcomes. Ability, with effort second, was used to explain success and failure in art. Children viewed football outcomes as uncontrollable. A major cause was effort, followed by ability. And "catching frogs was characterized by a high use of external causes . . . and unintentional causes" (p. 191). "The causes given by high-ability children to explain success were more internal than the causes they gave to explain failure but . . . this distinction was not observed in

the responses of the low-ability children" (p. 192). There were no significant sex differences.

Nicholls (1975) used fourth-grade boys and girls in his study of causal attributions. Before the practice the student was told how important the test was and how many items children his age usually got right. The child's attribution, expected number right the next time, minimal standard, anxiety, and positive affect responses were recorded before and after the test. The children, girls more than boys, attributed failure at the practice items to low ability more than they attributed success to high ability. "There was no main effect of test outcome on ability attributions" (p. 383). Attributions to ability were more often given when feedback was consistent. Success on both the practice and the test was more often attributed to effort than failure was to lack of effort. Expectancies were significantly influenced by feedback.

Pleasure with success is greater when success is determined internally (ability) and less when determined externally (difficulty). . . . Attribution of practice success to effort is associated with greater anxiety about and less positive anticipation of the forthcoming test. (p. 387)

Nicholls (1976) extended those findings giving college students a questionnaire. He found that "affective responses to perceptions of effort and ability depend on

the questions asked" (p. 309). It was discovered that when the task is related to some long term goal the students preferred high ability to high effort. "When asked what sort of person they would prefer to be, students . . . were biased toward high ability rather than high effort" (p. 309).

Nicholls (1978a) then investigated ethnic differences in causal attributions. "In this study, Maori and Pakeha New Zealand children made causal attributions for and predicted teacher evaluative reactions to performance of children in films" (p. 687). He found that the oldest children were able to separate effort from outcome and while ethnic differences were evident in the 7-year-olds there were no significant differences by age 13.

The age increases in ethnic similarity of attributions and expected evaluations imply that school experience produces similar perceptions of the causes and evaluative consequences of academic performance. (p. 688)

Nicholls (1978b) studied the developmental changes in causal attributions and achievement motivation in children aged 5 to 13. "The prime focus of this study was on the development of causal schemes for effort and ability" (p. 301). The children's responses were analyzed and they were assigned to one of four levels of reasoning. Those in the lowest level could not distinguish effort, ability

or outcome from each other. That skill developed gradually. It was found that "only at level 4 is ability clearly differentiated from effort and ability and effort seen as interdependent causes of outcomes" (p. 805). Also "there was a significant sex difference in levels of reasoning about ability and effort . . . with girls being less represented at the highest level" (p. 805). Another finding was that "at all levels children indicated that success due to high effort and low ability would be highly rewarded by teachers" (p. 806).

Still in New Zealand, Nicholls (1979) used 6, 8, 10, and 12 year olds in this study of attainment and causal attributions in reading. The developmental relationships were again observed. Positive correlations between perceptions of reading attainment, grades and attribution of success to ability increased with age from nonsignificant at 6 years to highly significant at 12 years. There was a significant negative correlation between perception of attainment and the attribution of success to luck at the 12 year old level, for both boys and girls. Girls were rated higher than boys by teachers and they rated themselves higher than boys rated themselves. But "girls were more inclined to attribute failure to poor ability than were boys" (p. 97). Nicholls suggested that "academic

achievement behavior should become more closely correlated with attainment with age" (p. 97). This lead to the conclusions that "inequality of academic motivation on the part of high and low achievers appears an inevitable consequence of accurate perception of attainment and logical reasoning about the causes of success and failure" (p. 98).

Ames, Ames, and Garrison (1977) investigated fourth, fifth, and sixth grade children's causal ascriptions for interpersonal outcomes. The students were divided into high and low social status and asked to fill out a questionnaire in which there were "three response choices, representing internal, external and mutual causes" (p. 598). Children of high social status gave internal ascriptions to positive outcomes and external ascriptions to negative outcomes significantly more often than did low social status students. "Children who hold a less positive view of their social competence appear not to employ such a self-enhancement strategy for positive events and engage in self-derogation for negative ones" (p. 600).

Competitive and non-competitive reward structures and their effect on fifth grade boys' achievement attributions were studied by Ames, Ames, and Felker (1977). After the puzzle tasks each boy was asked to attribute the outcome to ability, effort, task difficulty, or luck for both

himself and then for the other boy. Results showed that competitive settings increased the affective significance of the outcomes. "Competitive reward contingencies appear to accentuate the negativism in self-attributions and affective feelings" (p. 6). "Repeated experiences of this nature could conceivably contribute to a low-achievement-motive syndrome or to a 'learned helplessness'" (p. 7).

Carole Ames (1978) extended this work with fifth grade boys and girls, divided into high self-concept and low self-concept groups. "The children were tested in like-sex pairs" (p. 347). As reported previously (Ames, et al., 1977) high self-concept children, like high social status children, attributed success internally to ability and failure externally. Low self-concept children reacted to failure with self-criticism. Ames notes "the absence of any positive reaction to successful outcomes may reflect a resistance by those children to modify their negative self-appraisal" (p. 353). "It is rather clear from the data that merely arranging success experiences or removing some negative consequences of failure (as in the noncompetitive conditions) is not sufficient for enhancing self-esteem in the low self-concept child" (p. 354).

Ames and Felker (1979) compared the "effects of interpersonal competition with interpersonal cooperation,

including both successful and unsuccessful cooperative groups, on children's achievement-based cognitions" (p. 414). First through fifth grade boys and girls were tested individually. After one story was presented they were asked to evaluate it. The grade or sex variables were not found significant. Results of the study demonstrated clearly that "competition accentuates the value placed on achievement outcomes" (p. 418). Ames and Felker also found that "competition seemed to accentuate perceptions of individual differences, whereas cooperation tended to minimize these differences" (p. 419). If the cooperative group was successful a low performer was less critically evaluated. However in an unsuccessful cooperative group the low performers were more harshly judged.

Hyperactive Children and Attribution Theory

Whalen and Henker (1976) reviewed the literature dealing with hyperactivity and achievement noting that "the results to date are intriguing but inconclusive" (p. 1120). The authors proposed that investigating the "sociocognitive constructs developed by the child and others involved. . . . is . . . an alternate strategy for studying, understanding, and predicting the results of stimulant drug therapy" (p. 1121). Walen and Henker stated four hypotheses. First they suggest that parents and hyperactive children find

external attributions adaptive. Second, the stimulant treatment augments the external attributions. Third, these external attributions about problem solutions are counterproductive and interfere with effective coping and long-term maintenance of behavior change. More specifically, attributing success to the drug may attenuate achievement effort, particularly once drug treatment is terminated. (p. 1125)

Their final hypothesis "is that stimulant treatment facilitates external attributions about problem solutions. . . . The children are not personally responsible for their failures, but neither are they credited with their successes" (p. 1124). Whalen and Henker conclude that "successful medication responses have powerful attributional consequences" (p. 1126).

Bugental, Whalen, and Henker (1977) studied the efficacy of training programs with 36 hyperactive boys, 7 to 12 years old. Half were on psychostimulant medication. One treatment involved social reinforcement, or an external approach, and the other was internal using self-controlling speech. "All tutoring took place within the regular classroom setting" (p. 877). Two performance measures and an attribution (effort, teacher bias, and luck) measure were given. Results showed that nonmedicated children tended to make fewer errors on the Porteus Mazes after the self-control treatment, and medicated children made significantly

fewer errors after the social reinforcement treatment. When the child's degree of personal responsibility was matched to treatment the authors found that "children who made relatively high attributions to external causes were significantly more responsive to the reinforcement intervention than to the self-control procedures" (p. 881). They advised that "individuals who hold high expectations of personal-control capability may benefit most from interventions which provide objectively presented information and enhance problem solving skills" (p. 881).

Summary

Internal-external locus of control thus becomes two dimensions, internal-external and controllable-uncontrollable within the attribution theory model (Weiner, 1979). Seligman's "learned helplessness" dimensions in the reformulated model (Abramson et al., 1978) are nearly a perfect fit also. The attributional dimensions internal-external and stable-unstable are identical to those in the attribution theory model. However the global-specific dimension in learned helplessness appears to be a further division of the uncontrollable half of Weiner's controllability dimension, at least as it applies to helplessness and depression. Global uncontrollable attributions for failure would be

low ability (internal, stable), mood (internal, unstable), task difficulty (external, stable), and luck (external, unstable). Specific uncontrollable attributions for failure might be low ability in one subject, the cold I have made me do badly on that test, they give hard tests in this subject, and it was my bad luck to get the blurred copy. Weiner (1979) acknowledged that "other dimensions are likely to emerge with further analysis. . . . Intention may be one of these dimensions" (p. 7). However, at this time, the dimension of intentionality also seems to be a subdivision of the controllability dimension.

Therefore Weiner's theory of motivation, while still evolving, seems to have practical applications for the classroom. A child's typical effort (diligence or laziness) would be internal, stable, and controllable. The child's immediate effort (trying or not trying) would be internal, unstable, controllable. An attribution to teacher bias (for or against) would be external, stable, and controllable, while unusual help (or hindrance) from others would be external, unstable, and controllable. The child's perceived ability (high or low) would be internal, stable, and uncontrollable. Mood attributions would be internal, unstable, and uncontrollable. Task difficulty (easy or hard) would be external, stable, and uncontrollable. And

finally, attributions to luck are external, unstable, and uncontrollable.

The attribution "I'm dumb" is the worst one a child can make. It causes the greatest loss of self-esteem. Low ability is an internal, stable, uncontrollable attribute. The stability dimension predicts future outcomes. Failure results from stability. The stability dimension is linked to expectancy. Research indicates a causal relationship between learned helplessness and the expectation of bad outcomes.

Yet the literature also demonstrates that these causal attributions are learned. Therefore students who make maladaptive attributions can be taught to make attributions which will facilitate rather than hinder their academic progress. If research conducted in the schools can consolidate, refine, and extend the laboratory evidence, attribution theory may become a useful tool which teachers may use to accelerate the progress of their seemingly non-motivated students.

CHAPTER III

METHOD

The study was conducted in May, 1981, the last month of the school year. The sample consisted of 95 non-handicapped and learning disabled fourth grade boys and girls from three school districts in the Dallas/Ft. Worth metroplex area of North Texas. Letters from school district personnel authorizing this study are reproduced in Appendix E. Authorization from the TWU Human Research Review Committee is in Appendix F. The boys and girls who returned parent consent forms, and who themselves consented to participate, comprised the research population.

Children with learning disabilities (LD) were defined as those children so identified by an Admissions, Review, and Dismissal (ARD) Committee and who were receiving special education services in a resource room less than 50% of the school day. Non-handicapped (NH) children were defined as all those children who were not identified as being handicapped in any way.

The children in the fourth grade classes of the schools which participated in this study were asked to take a two page letter home to their parents. The first page described

the study and gave phone numbers where more information could be obtained. The second page was the consent form which was to be returned to the school if they wished their child to participate. These letters and consent forms are also reproduced in Appendix D and follow the respective letter of authorization from each of the participating school districts. Because the return rate was generally poor (ranging from 10 to 13 percent), the researcher was allowed to speak to each of the three fourth grade classes in one of the schools prior to the handing out of the letters to take home. This effort did seem to make a significant difference since nearly one-fourth of those students volunteered.

Within the total of 95 fourth grade children there were 48 boys and 47 girls. There were 62 non-handicapped children (27 NH boys and 35 NH girls) and 33 learning disabled children (21 LD boys and 12 LD girls). Incidence figures for learning disabilities vary greatly, depending upon the criterion used. Kirk and Gallagher (1979) report that "the best guess at this time is that learning disabled children constitute 1 to 3 percent of the school age population" (p. 294). The incidence of LD children by gender has been found to be a ratio of four boys to one girl (Kirk & Gallagher, 1979; Lerner, 1976). Though the effort to

obtain equal numbers of NH and LD children was unsuccessful, the number of LD boys and LD girls who participated in the study exceeds the expected proportions. All told, more than 100 children volunteered to participate and 95 fit the stated limitations of the study.

Limitations of the Study

For the purpose of this study, the following limitations were assumed:

1. The study was limited to one geographic area.
2. The sample was restricted to Caucasian children.
3. The sample was restricted to children whose native language is English.
4. The socio-economic background of the students was outside the scope of this study.

Instrumentation

Two questionnaires were individually administered to each child. One specifically measured internal locus of control in academic situations: The Intellectual Achievement Responsibility Questionnaire (IAR). The other identified the child's attributions for academic successes and failures: The Bonnington-Jolly Attribution Scale for Children (ASC).

Intellectual Achievement Responsibility

Questionnaire (IAR)

Because locus of control is a very broad concept, Crandall, Katkovsky, and Crandall (1965) created an instrument which covers the limited school behaviors of children (grades 3-12) and limits the reinforcing others to peers, parents, and teachers. It is a 34 item forced-choice questionnaire. Here is an example:

When you find it easy to work arithmetic or math problems at school, is it usually
a. because the teacher gave you especially easy problems, or b. because you studied your book well before you tried them? (p. 97)

Seventeen of the items have success or positive stems. The other 17 have failure or negative stems. In the normative sample the I+ versus I- correlation coefficient for fourth grade was .11 raising "the possibility that self-responsibility for successes and failures may be learned separately, and the young child may assume more responsibility for the one than for the other" (p. 102). The means, standard deviations, and ranges of the IAR scores for the normative sample are reproduced in Appendix A.

At the fourth grade level there were no significant sex differences in IAR scores. Approximately 45% (47 of 103) of the normative group in grades 3, 4, and 5 were

retested after 2 months. Test retest correlations were .66 for Total I, .66 for I+ and .74 for I- scores. These correlations were all significant at the .001 level (p. 100).

Grades 3, 4, and 5 were grouped for the correlations between IQ and social status. The IAR scores related only moderately to IQ as measured by the Lorge-Thorndike (r : Total I .26, I+ .22 & I- .14). Only the I+ scores (r = .17) correlated significantly with social class.

Achievement test scores and report card grade averages correlated positively and significantly with the Total I scores of grades 3, 4, and 5. However there were some sex differences between the subscales. I+ scores for girls in grades 3 and 4 were highly related to achievement and grades while fifth grade boys' achievement and grades related highly to I- scores (p. 107). "The scale, then, predicts differently for the two sexes at different age levels" (p. 108).

MacDonald (1973) and Phares (1976) cite the IAR as a frequently used scale and the instrument of choice with which to measure children's locus of control in school situations. The IAR is reproduced in its entirety in Appendix B.

Bonnington-Jolly Attribution Scale
for Children (ASC)

The Bonnington-Jolly Attribution Scale for Children (ASC) is a 30 item questionnaire which attempts to include the three dimensions (internal-external, controllable-uncontrollable, stable-unstable) found in Weiner's (1979) attribution theory. Each stem (15 failure and 15 success) is followed by the eight possible responses. The child was asked to pick the most important cause of that particular outcome. All the outcomes are unspecified academic situations. There is one form for girls with girls' names and pronouns and one form for boys with boys' names and pronouns. Here is an example:

(Ann/Jim) got a good grade on (his/her) report card. Why?

1. (Ann/Jim) likes that subject.
2. (Ann/Jim) is the teacher's pet.
3. (Ann/Jim) is smart.
4. That subject is easy for (Ann/Jim).
5. (Ann/Jim) tried harder this time.
6. The whole class got good grades.
7. (His/Her) mom helped.
8. (Ann/Jim) felt good.

After the first pilot study the ASC was revised and a second pilot study was conducted. The need for a printed copy of the ASC for the student to look at was verified.

The ASC was developed in an attempt to fill the unmet need for an instrument which would not confound attributional dimensions and thus permit both the examination of the

validity of Weiner's 1979 model of an attributional theory of motivation, and an examination of its relevance to children's motivation(s) in school situations. The results of the research with the IAR are conflicting and thus difficult to apply to classroom behaviors. This suggests that the single dimension of internal-external does not discriminate sufficiently to isolate precise behaviors or beliefs so that non-adaptive (i.e. failure) behaviors might be remediated. The research behind the attribution theory model suggests that this theory of motivation may indeed lead to a practical way of defining motivation variables. Once the variables which appear most directly related to academic success and failure are identified in many children, the case may be made for remedial teaching of attributions which lead to successful outcomes to those students who expect to fail. The ASC questionnaire is reproduced in its entirety in Appendix C.

Procedures

Testing was conducted at the convenience of the school districts, students, and parents. All names were coded, and no school or individual was identified by name in the final reporting of the data. Testing was conducted in an area designated by the school principal. Test days were

scheduled so as not to compete with other school activities or holiday periods in order that students would have the maximum opportunity to attend.

The primary researcher was assisted by three women who were trained by her to administer the two questionnaires. All three were Texas Woman's University students. Two were undergraduates and the third was a graduate student. Each was instructed individually in the administration of the two questionnaires, the order of administration, the coding of response forms, and the manner in which to record responses. The explanation of the proceedings to the child was written out and followed by each examiner. The explanations and/or introductions are included with the questionnaires in the appendices. Any further questions asked by the child were answered. Each questionnaire was completed at one sitting, however on some occasions it was necessary to have a break between the questionnaires because of lunch or recess.

The student was presented with a copy of the IAR. The four pages were typed on white paper in pica type (just as it appears in Appendix B) and placed in a spiral bound booklet. The ASC was typed with an IBM Orator type element, which is a large capital letter style. One question was typed on each 5½ inch by 8½ inch page. The pages were

laminated and spiral bound. The ASC was color coded: yellow for girls and blue for boys. Both questionnaires were recorded on cassette tapes so that every student would hear the same tone, inflection, stress, phrasing, etc. The IAR Questionnaire took 6 minutes 6 seconds if there were no additional pauses between questions. The ASC for girls was 13 minutes 12 seconds long. The ASC for boys was 13 minutes 10 seconds long. Total test times varied according to how quickly the student responded. Most administrations took about 25 minutes, including the introductory explanatory remarks.

The researcher obtained the 5th period report card grades for every student who participated in the study. Grading practices varied from district to district, from school to school, and from teacher to teacher. No attempt was made to weight grades according to whether or not the child was working on grade level, since the emphasis was on how well the child performed at his own level academically. The schools involved gave either letter grades (A, B, C, D, & F) or word equivalents (strong, satisfactory, needs improvement, unsatisfactory). Table 1 illustrates the method of assigning a decimal equivalent for those grades so that each child's grade point average could be computed for use in the statistical analyses.

Table 1

Report Card Grades with Their Decimal Equivalents

Report Card Grades		Decimal Equivalents
Letter	Word(s)	
A+	Strong	4.00
A		3.66
A-	Satisfactory +	3.33
B+		3.00
B	Satisfactory	2.66
B-		2.33
C+	Satisfactory -	2.00
C		1.66
C-		1.33
D+	Needs Improvement	1.00
D		0.66
D-		0.33
F	Unsatisfactory	0.00

CHAPTER IV

RESULTS

The purpose of this study was to determine the relationship between attributional styles and academic success or failure of non-handicapped and learning disabled fourth grade boys and girls. It was hoped to identify the motivation variables most directly associated with report card grades. In order to look for possible combinations of factors which might discriminate between successful students and unsuccessful students, multivariate methods of statistical analysis were used with $\alpha = .05$.

When people have been classified into two nominal categories and other tests have been given them that appear to discriminate between the two groups, Morrison (1976) does not think it proper to use univariate t statistics to test mean differences. Using the WAIS as an example, he added "we must have protection against the effects of positive correlations among the subtests as well as the tendency for individual differences to be significant merely by chance as more responses are included" (p. 139).

Another reason why multivariate methods are preferred was given by Afifi and Azen (1979). They stated

Historically, statistical analysis of more than one variable considered each variable separately. This procedure was limited, since overall inference statements could not be easily made from the individual inference statements. Multivariate techniques make such overall inference statements possible. (p. 280)

Since the purpose of this study was to identify motivational variables which would discriminate between successful students and unsuccessful students, it was felt that a method which could look at many variables, rather than one variable, at a time would be more productive. When the classification to nominal groups is desired, the linear discriminant function index may be used. Morrison advised

rather than test the usual hypothesis of equal mean vectors we wish to construct a linear compound or index for summarizing observations from the groups on a one-dimensional scale that discriminates between the populations by some measure of maximal separation. (p. 231)

Therefore it was decided to analyze the data using a two-way analysis of variance to test the first hypothesis and to use both a direct discriminant analysis and a step-wise discriminant analysis to test the second and third hypotheses.

An inferential method was used to evaluate the fourth hypothesis since it proved impossible to rank the data as originally planned.

The null hypotheses for this study were:

Ho₁: There will be no significant differences between the mean grade point averages (GPAs) of children whether they are non-handicapped or learning disabled, boys or girls.

Ho₂: On the IAR there will be no significant differences between the responses made by successful students and the responses made by unsuccessful students whether they are non-handicapped or learning disabled, boys or girls.

A. Using a direct method of discriminant analysis the IAR will have no linear discriminating ability to differentiate between successful students and unsuccessful students.

1. Sex will not be a significant predictor variable in conjunction with the IAR.
2. Condition will not be a significant predictor variable in conjunction with the IAR.

B. Using a stepwise method of discriminant analysis the IAR will have no linear discriminating ability to differentiate between successful students and unsuccessful students.

1. Sex will not be a significant predictor variable in conjunction with the IAR.
2. Condition will not be a significant predictor variable in conjunction with the IAR.

Ho₃: On the ASC there will be no significant differences between the responses made by successful students and the responses made by unsuccessful students whether they are non-handicapped or learning disabled, boys or girls.

A. Using a direct method of discriminant analysis the ASC will have no linear discriminating ability to differentiate between successful students and unsuccessful students.

1. Sex will not be a significant predictor variable in conjunction with the ASC.
2. Condition will not be a significant predictor variable in conjunction with the ASC.

B. Using a stepwise method of discriminant analysis the ASC will have no linear discriminating ability to differentiate between successful students and unsuccessful students.

1. Sex will not be a significant predictor variable in conjunction with the ASC.
2. Condition will not be a significant predictor variable in conjunction with the ASC.

Ho₄: There will be no interaction between the way responses made by successful students, versus those made by unsuccessful students, appear within the three dimensions of the ASC, thus the significant predictor variables will be situationally located the same, or as reflections, in both parts of each ASC dimension.

Analysis of the GPAs

A two-way analysis of variance was used to test the first hypothesis that the group mean GPAs would be equal. The cell and marginal mean GPAs are given in Table 2.

Table 2

Table of Cell and Marginal Mean GPAs

	NH	LD	
Boy	2.89 (<u>n</u> =27)	2.25 (<u>n</u> =21)	2.61
Girl	2.89 (<u>n</u> =35)	2.48 (<u>n</u> =12)	2.78
	2.89	2.33	2.70

As can be seen in Table 3, the analysis of variance summary table of group mean GPAs, the means of the NH children and the LD children were significantly different, $F(1,94) = 10.739$, $p < .001$. Boys' GPAs were not significantly different from girls' GPAs. Therefore the null of no significant differences between the mean GPAs of boys and girls was not rejected. The null hypothesis that there would be no significant differences between the mean GPAs of non-handicapped and learning disabled children was rejected.

Table 3
Analysis of Variance of Grade Point
Average Scores

Source	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u> Ratio	<u>p</u>
sex (A)	1	.128	.128	.227	.635
condition (B)	1	6.054	6.054	10.739	.001
A x B	1	.263	.263	.466	.496
Error	91	51.299	.564		
Total	94	58.328	.621		

Analysis of the IAR

Discriminant analysis methods were used to test the second hypothesis. The direct method allows the entering of all the variables (sex, condition, I+ and I- scores) into the analysis at one time. The children were dichotomized into a successful student group ($GPA \geq 2.0$) and an unsuccessful student group ($GPA < 2.0$). IAR group means and standard deviations are given in Table 4.

Table 4
Criterion Group Means and Standard
Deviations on the IAR

Group	IAR I+		IAR I-	
	Mean	<u>SD</u>	Mean	<u>SD</u>
Successful Students	13.58	2.02	11.29	2.26
Unsuccessful Students	12.00	2.53	11.00	2.88

In order to determine if the predictor variables (sex, condition, I+ and I- scores) could discriminate between the criterion groups (successful students--unsuccessful students) the Wilks Lambda (U-statistic) was used.

Table 5
Wilks lambda and Univariate F Ratios for
the IAR Predictor Variables

Variable	Wilks lambda	<u>F</u> (df=1/93)	<u>p</u>
sex	.99735	.25	.6200
condition	.95865	4.01	.0481
IAR I+	.92540	7.50	.0074
IAR I-	.99785	.20	.6551

IAR I+ reached significance but IAR I- did not. Testing the hypothesis that sex would not be a significant predictor, the non significant result indicated that $H_{0_{2A(1)}}$ should not be rejected. Examining the null $H_{0_{2A(2)}}$, the significant results obtained for condition $F(1,93) = 4.01$, $p < .05$, indicated this hypothesis should be rejected. Knowledge of whether the child is non-handicapped or learning disabled did discriminate between criterion groups. Sex did not.

The direct discriminant analysis was performed. The canonical discriminant function failed to reach significance, $\chi^2(4) = 8.7670$, $p = .0672$. Thus the null hypothesis that using a direct method the IAR would have no linear discriminating ability to differentiate between the criterion groups could not be rejected.

The standardized canonical discriminant function coefficients showed that IAR I+ (-.85391) and condition (.38422) had coefficients with the largest absolute value. Pooled within-groups correlations between canonical discriminant functions and discriminating variables were similar. IAR I+ (-.89281) and condition (.65304) had the largest correlation coefficients. Sex (-.16222) and IAR I- (-.14612) were not very strong correlations.

The Box's M test failed to reach significance indicating no significant difference in the group covariance matrices.

Using the discriminant function coefficient to predict group membership, 71.53 percent of the students were correctly classified.

Testing part B of the second hypothesis, a discriminant analysis using the stepwise method was performed next. A summary of the stepwise analysis is given in Table 6.

Table 6

Stepwise Discriminant Analysis of IAR

Step	Variables		Wilks lambda	Equivalent <u>F</u>	<u>df</u>	<u>p</u>
	Entered	In				
1	IAR I+	1	.925399	7.50	1,93	.0074
2	Condition	2	.911053	4.49	2,92	.0138

Sex and the IAR I- variables did not enter the analysis. Since sex again did not reach significance, hypothesis $H_{02B(1)}$ was not rejected. Sex was not a significant predictor variable.

Since condition did enter into the stepwise analysis, it was significant. Classification function coefficients for condition, IAR I+ and the constant, were then used to compute the canonical discriminant function used in the remaining analysis. This function (Wilks lambda = .9110533, chi-square = 8.5402, df = 2) was significant at the .0138 level. Thus the hypothesis $H_{02B(2)}$, that condition would not be a significant predictor variable in conjunction with the IAR, was rejected. The null hypothesis (H_{02B}) that using the stepwise method the IAR would have no linear discriminating ability to differentiate between the criterion groups, was also rejected.

Box's M test of equality of group covariance matrices was not significant, demonstrating that the variability in the groups was within normal limits.

Using the IAR I+ score plus the knowledge of whether the student was non-handicapped or learning disabled (i.e. the canonical discriminant function) students would be correctly classified into the two criterion groups 69.47 percent of the time.

Analysis of the ASC

The third null hypothesis was then tested in the same way the IAR was tested. First, a direct discriminant analysis of the ASC was performed. The criterion groups were defined by GPAs. Unsuccessful students had less than a 2.0 GPA. The GPA of successful students was 2.0 or greater. The ASC criterion means and standard deviations are given in Appendix D. The predictor variables were sex, condition, and all 16 ASC scores. Representative attributions for the ASC categories are given in Table 7.

All the variables, except ASCS-8 (good luck) which failed the tolerance test, were entered into the direct analysis. The canonical discriminant function failed to reach significance (Wilks lambda = .7485612, chi-square = 24.471, df = 17, p = .1072). Therefore null hypothesis H_{03A} was not rejected.

The Box test of equal group covariances could not be performed because there were too few cases in the unsuccessful student group (n = 16). Using the discriminant function coefficient to predict criterion group membership, 80 percent of the students were correctly classified.

Testing H_{03B} , a discriminant analysis using the stepwise method was performed next. A summary of the stepwise

Table 7

Representative Attributions for Success and
Failure by ASC Category

ASC Category	Representative Attributions	
	Success (ASCS)	Failure (ASCF)
1. Typical effort	always worked hard interested (diligent)	never works not interested (lazy)
2. Immediate effort	tried paid attention listened	didn't try didn't pay attention didn't listen
3. Ability	smart understands it	dumb doesn't understand it
4. Mood	well/feels good (good mood)	sick/feels bad (bad mood)
5. Teacher bias	teacher's pet	teacher was too fussy teacher was a grouch
6. Unusual help	a friend helped	someone bothered him/her
7. Task difficulty	task was easy was an easy test	task was hard wasn't a fair test
8. Luck	good luck everybody did well	bad luck everybody did badly

analysis is given in Table 8. Five variables contributed significantly to the discrimination between the criterion groups, three from the success half of the ASC and two from the failure half. The top two, ASCS-5 and ASCF-5, represented teacher bias for and teacher bias against.

Table 8
Stepwise Discriminant Analysis of ASC

Step	Variables		Wilks lambda	Equivalent F	df	p
	Entered	In				
1	ASC S-5	1	.895254	10.88	1, 93	.0014
2	ASC F-5	2	.859864	7.50	2, 92	.0010
3	ASC S-6	3	.827140	6.34	3, 91	.0006
4	ASC F-1	4	.800334	5.61	4, 90	.0004
5	ASC S-2	5	.786203	4.84	5, 89	.0006

The attribution of unusual help (ASCS-6) was third. Not interested or lazy (ASCF-1) came next and the last significant variable was tried (ASCS-2). Since neither sex nor condition reached significance, the null hypotheses $H_{03B(1)}$ and (2) may not be rejected. On the ASC, sex and condition were not significant prediction variables.

The canonical discriminant function (incorporating the 5 variables which were significant predictors) had a Wilks

$\lambda = .7862031$, chi-square = 21.769, $df = 5$, $p = .006$. Therefore H_{03B} , that the ASC would have no linear discriminating ability to discriminate between the criterion groups was rejected. Using the canonical discriminant function, 80 percent of the students were correctly classified. Compared to the IAR stepwise analysis, the ASC was a 10 percent better discriminator.

The fourth hypothesis, concerning the three dimensions of the ASC, was examined by identifying the dimensions in which the significant predictor variables were located. The ASC categories and dimensions are listed in Table 9. Representative attributions for those ASC categories may be found in Table 7.

Table 9

Listing of ASC Categories by Dimension

Dimension	Categories (ASCS/F)			
Internal	1	2	3	4
External	5	6	7	8
Stable	1	3	5	7
Unstable	2	4	6	8
Controllable	1	2	5	6
Uncontrollable	3	4	7	8

The significant predictor variables were ASCS-5 (teacher bias for), ASCF-5 (teacher bias against), ASCS-6 (unusual help from others), ASCF-1 (typical effort--lazy) and ASCS-2 (immediate effort--tried). Category 5 was significant in both success and failure situations. This category is stable, external and controllable. Category 6 is external, unstable and controllable. Category 1 is internal, stable, and controllable. Category 2 is internal, unstable, and controllable. Table 10 shows the location of the predictor variables. On the stable-unstable dimension, 3 were stable and 2 were unstable. On the internal-external dimension 2 were internal and 3 were external. On the controllable-uncontrollable dimension all 5 were controllable.

Table 10

Location of the Significant ASC Predictor
Variables Within ASC Dimensions

Dimension	Predictor Variables	
	Failure (ASCF)	Success (ASCS)
Internal	1	2
External	5	5,6
Stable	1,5	5
Unstable	none	2,6
Controllable	1,5	2,5,6
Uncontrollable	none	none

The differing patterns illustrated in Table 10 show that there is interaction among the cells. In this study, an unsuccessful student would be very likely to choose external controllable and/or unstable controllable attributions for success and stable controllable attributions for failure. The significant predictor variables were not located the same or as reflections in both parts of each ASC dimension. Therefore H_{04} was rejected.

CHAPTER V

DISCUSSION

Attribution theory, as examined in this study, shows promise even though the ASC itself did not obtain statistically significant results in the direct analysis. Nevertheless, the ASC captured more information than the IAR and this study may be the first step in the development of an instrument which can measure motivation more precisely.

Sex as a Predictor Variable

One result was that there were no significant sex differences on either questionnaire, the IAR or ASC, or in grade point averages. The literature on the IAR concerning both locus of control and attribution theory, and on attribution theory, is contradictory.

Condition as a Predictor Variable

On grade point averages there was a significant difference between non-handicapped and learning disabled students, but non-handicapped and learning disabled students did not differ enough in their responses on the IAR to eliminate the need for the additional information about the child's

condition (NH or LD) in order to predict academic success or failure. The entry of the condition variable into the stepwise discriminant analysis is a test of the hypothesis for condition which may be stated "given that IAR I+ is in the discriminant function, condition is not significant." Rejection of this hypothesis means that the IAR I+ score did not capture all the information about LD students. The IAR I+ variable was not independent of the condition variable however, since the F value for condition dropped from 4.01 to 1.45 after IAR I+ entered the discriminant function. Even so, it appears that two different discriminant functions are needed, one for NH children and one for LD children. The discriminant function given for this sample was: Success/Failure (S/F) Group = .78121 (IAR I+) -.43651 (condition, i.e. successful students = 0 and unsuccessful students = 1). Therefore the discriminant function for NH children is: S/F Group = .78121 (IAR I+), and for LD children it is: S/F Group = .78121 (IAR I+) -.43651. The NH and LD children simply do not make IAR scores different enough to eliminate the need for the information on handicapping condition when it is available.

It appears that the ASC captures the condition of the student so that additional information is not needed in

order to predict academic success or failure. In the discriminant analysis, the five ASC scores entered the discriminant function first because they were "better" single predictors of success or failure than condition. Once they were entered, no further variables were found that could significantly contribute to the discrimination between S/F groups. Since no further information would be added by entering the condition variable, it means that the NH students and the LD students scored significantly differently on the ASC so the LD condition information was captured by the ASC. This also means that two different discriminant functions are not needed in order to classify NH and LD children as successful or unsuccessful students.

The Predictor Variable on the IAR

The IAR I+ score was the significant predictor variable on that instrument. The more responsibility a child took for his/her successes, the more likely the child was to be a successful student--unless that child was also learning disabled. The IAR I- means and standard deviations were very similar whether the child was academically successful or unsuccessful (see Table 4), or whether the child was non-handicapped (mean = 11.23, SD = 2.13) or learning disabled

(mean = 11.27, SD = 2.78). I- scores, taking responsibility for failure, did not discriminate in this sample.

These findings extend previous research conducted by Chapman and Boersma (1979) with third through sixth grade students and Hill (1980) with third and sixth grade students. They too found that there were no significant differences between LD students and their non-LD classmates on the I-scale.

Predictor Variables on the ASC

The ASC variables which were significant predictors ranged from those which were rarely chosen to those chosen by everyone or nearly everyone. The first three to enter the stepwise analysis (teacher bias for, teacher bias against, and unusual help), appeared to capture the "essence" of the learning disability condition. In the original series of F tests to select the independent variables which best predict academic success or failure unusual help and condition were tied for third place with an F = 4.01. After step 1 in the stepwise analysis, condition, F = 1.80, dropped to fourth place. After step 2, with teacher bias for and teacher bias against in the discriminant function, condition, F = 2.13, was third in the list of remaining variables, and unusual help, F = 3.60, being first, was

entered into the function. Following step 3, condition, $F = .47$, dropped out of contention. Examining the raw scores (see Appendix G) for the categories which were identified as significant predictor variables the following was observed. A greater proportion of LD students than NH students selected teacher bias for at least once. The two groups were almost equally likely to choose teacher bias against. Unusual help was an attribution given by a greater proportion of LD children than NH children. Thus it seems that LD children tend to ascribe success experiences to an external other person. With this information the ASC does not require knowledge of condition in order to assign a student to a success/failure group.

The remaining two ASC discriminators were selected by most of the children. Not interested or never works was the attribution selected at least once by 66% of NH children and 76% of LD children to explain failure situations. All but one child in the total sample chose tried, at least once, to explain success. Table 11 presents the descriptive statistics for this variable.

Table 11

Table of Descriptive Statistics for the Number of
Times the Attribution Tried Was Used

Group	<u>n</u>	Σ	Mean	<u>SD</u>	Range
NH boys	27	273	8.78	3.03	4-15
girls	35	320	9.14	2.65	3-14
LD boys	21	158	7.52	2.98	2-13
girls	12	83	6.92	4.36	0-13

When correlations between GPA and tried were computed the correlation coefficient obtained was not statistically significant for either the NH students ($\underline{r} = .15563$, $\underline{p} = .11345$) or the LD students ($\underline{r} = -.03440$, $\underline{p} = .42464$). This indicates that it is the combination of predictor variables that effectively predicts academic success or failure, rather than any one variable by itself.

Since it is a combination of variables which interact to produce a discriminant score with which to predict academic success or failure, it is not possible to give a single profile which discriminates between successful and unsuccessful students. However, some generalizations can be made.

The student who selects teacher bias for, teacher bias against, and/or unusual help, which were the first three variables to enter the stepwise analysis and which had the largest discriminant function coefficients (see Table 12), is at risk of being or becoming an unsuccessful student.

Table 12

Canonical Discriminant Function Coefficients for the
Significant ASC Predictor Variables

ASC Variable	Canonical Discriminant Function Coefficients	
	Standardized	Unstandardized
Success		
2	-.32129	-.1020308
5	-.61754	-.9736476
6	-.52288	-.6808257
Failure		
1	-.42813	-.3044939
5	-.53249	-.7991113
Constant		1.839426

Note. The coefficients are stated negatively because of the manner in which the criterion groups were labeled (group 0 = successful students; group 1 = unsuccessful students) in the analysis.

Those three had the largest weights and therefore are the most maladaptive attributions a student could select in this study. When failure is explained by not interested or never works, that too can be maladaptive. For example, a student could select tried all 15 opportunities, plus choosing never works or not interested once or twice and still not be classified as unsuccessful because the positive constant discriminant function coefficient is added to the others when the discriminant score is computed. The discriminant score for a student whose raw scores are tried - 15, teacher bias for - 0, unusual help - 0, never works - 2, and teacher bias against - 0, would be equal to $-.3000238$. The complete computation of the score for this example is given in Appendix H. The successful student group mean function was $.23220$, the unsuccessful student group function was -1.14648 , so the mean total group function was $-.45714$. The hypothetical student above would be classified as a successful student because the obtained discriminant score exceeds the mean total group function.

If the ASC can be improved so that its predictions become statistically significant, it could indeed become a useful screening device. Tables could be created so that the user would not have to do the calculations. Children who are at risk of becoming or who already are unsuccessful

students because of their attitudes, could be objectively identified so they could be helped to learn ways to earn higher grades in school. Of course it would be possible that when a student gives the attributions which have been labeled in this study as maladaptive, that the student is correctly perceiving his/her environment. Perhaps it is chaotic. Maybe the teacher is biased. If so, there is added cause to make changes in the environment, i.e. teacher behavior.

It appears that the attributions children give may interact with retraining methods. For example, Bugental, Whalen, and Henker (1977) found that

children who made relatively high attributions to external causes were significantly more responsive to the reinforcement intervention (method). . . . For these children external, contingent reinforcement may serve to increase environmental consistency and introduce the possibility that they can influence outcomes through their own actions. . . . Introducing regularities or systematic extrinsic reinforcement into the environment of an individual who believes events are random or chaotic may be a productive prelude to self-management training. (p. 381)

In this instance, a specific intervention technique--social reinforcement--was more effective when matched with the child's specific attributions--external, in this case. Children who gave internal attributions did not respond

well to the social reinforcement method (Bugental et al., 1977).

It appears that the intervention method must be tailored to fit the specific attributions given by a child. Therefore, it is not surprising that it has been difficult to structure the classroom environment so as to help children who appear unmotivated, who have given up, and/or who have learned helplessness. In order to help children who behave that way, the classroom teacher needs some way to evaluate not only the child but the possible intervention techniques. Some training methods which have been investigated are attribution retraining and success only methods (Dweck, 1975), social reinforcement with and/or without tokens (Andrews & Debus, 1978; Bugental et al., 1977), and a self-control verbal monitoring technique (Bugental et al., 1977).

Recommendations

In this study the ASC classified students nearly 10% more accurately than did the IAR. In order to improve the ASC so that it might become statistically significant because it identifies the critical variables associated with academic success or failure, the following is suggested.

1. This study needs replication, at least in the administration of the ASC, in order to affirm current results. The analysis might have been more effective if there had been more students in the unsuccessful group.

2. It might be wise to ask children what the attributions given on the ASC mean to them. Was the vocabulary used in the questionnaire truly appropriate?

3. The structure of the ASC questionnaire should be examined. Are the items equivalent? The assertion that diligence or always works hard is equivalent to interested needs examination. All of the ASC categories had more than one way of phrasing the attributions assigned to that category. Perhaps the way the items were phrased made a difference in their selection. The way attributions are worded needs systematic analysis.

4. Possible age and grade effects need to be taken into consideration. Perhaps children of different ages and in different grades might respond differently to the ASC.

5. When this study is replicated, perhaps standardized achievement test scores could be included. The connection between motivation and achievement could be examined with two very different measures: report card grades and standardized achievement test scores.

6. No attempt was made in this study to adjust scores on the basis of IQ. Learning disabled students, on the basis of their identification and placement by an ARD committee, had average or better intelligence. Records of non-handicapped students were not examined to determine anything other than their current report card grades. The literature did not indicate that IQ was a factor. Perhaps group IQ test scores or group mental ages could be included to determine if intelligence remains non-significant as far as the selection of attributions for success or failure is concerned.

7. Finally, the three ASC predictor variables with the heaviest weights were the three which captured the learning disabled condition. The learned helplessness construct might be an extremely relevant component and one which may indeed warrant a more direct examination.

Conclusion

The subject of motivation was perceived as a critical variable when the dissertation topic was discussed with teachers and administrators. Even when permission to conduct this research was denied by an administrator (for unrelated reasons), motivation variables were acknowledged to be of interest. Many of the classroom teachers whose

students participated in this study expressed interest in the study and wished for practical effective ways to reach those students who appeared to have problems with motivation.

The problem is by no means confined to those students who qualify for special education services. In fact, the "problem student" a teacher might use as an example would very likely be one the teacher perceived as capable but who, for whatever reason, refused to exert much effort. It does not take an attribution theorist to assert that a student like that is one a teacher finds quite frustrating to have in the class.

Given the needs expressed by educators and the encouraging results obtained in this study, it appears that further study is warranted. Teachers need tools and methods by which the progress of their seemingly unmotivated students might be accelerated. If an objective, easily, and quickly administered instrument can be developed which accurately measures the motivation variables which contribute to academic achievement, perhaps the students who make maladaptive attributions can not only be identified, but retrained to make attributions which will facilitate rather than hinder their academic progress.

APPENDIX A

Means, Standard Deviations
and Ranges of IAR Scores

TABLE 2
MEANS, STANDARD DEVIATIONS AND RANGES OF IAR SCORES

SUBJECTS AND GRADE	N	Total I			I+			I-		
		Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Boys:										
3...	44	23.16	3.80	16-30	12.32	2.02	8-16	10.84	3.08	4-16
4...	59	24.83	3.00	17-30	12.41	2.07	7-16	12.42	2.08	8-17
5...	52	24.04	3.69	16-31	12.38	2.52	7-16	11.65	2.46	3-16
6...	93	24.74	4.57	12-32	12.99	2.54	6-17	11.75	2.79	5-17
8...	68	25.88	3.51	15-32	13.07	1.97	7-17	12.31	2.23	5-16
10...	90	25.27	4.62	6-32	13.13	2.60	2-17	12.13	2.83	4-16
12...	52	24.38	3.71	14-30	11.85	2.83	5-17	12.54	1.96	8-16
Girls:										
3...	58	23.22	4.00	13-31	12.83	2.08	8-16	10.35	3.01	2-15
4...	44	24.75	3.81	15-30	12.66	2.29	7-17	12.04	2.65	5-16
5...	47	24.36	3.96	15-32	12.47	2.54	6-17	11.85	2.92	1-16
6...	73	26.93	3.71	14-33	13.88	2.21	5-17	13.05	2.43	6-16
8...	93	26.64	3.86	13-34	13.27	2.35	7-17	13.38	2.27	6-17
10...	93	26.50	3.93	16-33	13.29	2.22	6-17	13.22	2.40	5-17
12...	57	27.33	2.98	19-32	13.40	2.15	6-17	13.93	1.94	8-17
Total:										
3...	102	23.20	3.92	13-31	12.64	2.08	8-16	10.56	3.05	2-16
4...	103	24.80	3.37	15-30	12.51	2.13	7-17	12.26	2.35	5-17
5...	99	24.19	3.83	15-32	12.42	2.53	6-17	11.75	2.69	1-16
6...	166	25.70	4.35	12-33	13.38	2.44	5-17	12.32	2.72	5-17
8...	161	26.11	3.77	13-34	13.19	2.20	7-17	12.92	2.31	5-17
10...	183	25.90	4.33	6-33	13.21	2.41	2-17	12.68	2.68	4-17
12...	109	25.93	3.66	14-32	12.66	2.62	5-17	13.27	2.07	8-17

(Crandall, Katkovsky, & Crandall, 1965, p. 100)

APPENDIX B

The Intellectual Achievement Responsibility Questionnaire (IAR)

Introduction to the IAR

As the examiner and the student sit at the testing table, the examiner says:

Remember the letter you took home with this permission form? Did you read it or talk about it with your mom or dad? Well, this is what it's about. I have 2 questionnaires. Each one is recorded on a tape we'll listen to, and you can look at a copy and read along if you want to. Then you just tell me your choice of the answers given and I'll mark it on this response form. These forms have a code so your name isn't on it. There aren't any "right" answers. I really want to know what your opinion is. This first questionnaire is kind of general--about all different kinds of situations. (Show a copy of the IAR) See, here's the first question. Listen to the tape and then tell me if you pick "a" or "b". Do you understand? Do you have any questions? If you need time to think about your answer that's OK. See, we can stop the tape by using the "pause" control (demonstrate). Well, let's get started and you'll see how this works.

The IAR Scale

1. If a teacher passes you to the next grade, would it probably be
 - a. because she liked you, or
 - b. because of the work you did?
2. When you do well on a test at school, is it more likely to be
 - a. because you studied for it, or
 - b. because the test was especially easy?
3. When you have trouble understanding something in school, it is usually
 - a. because the teacher didn't explain it clearly, or
 - b. because you didn't listen carefully?
4. When you read a story and can't remember much of it, is it usually
 - a. because the story wasn't well written, or
 - b. because you weren't interested in the story?
5. Suppose your parents say you are doing well in school. Is this likely to happen
 - a. because your school work is good, or
 - b. because they are in a good mood?
6. Suppose you did better than usual in a subject at school. Would it probably happen
 - a. because you tried harder, or
 - b. because someone helped you?
7. When you lose at a game of cards or checkers, does it usually happen
 - a. because the other player is good at the game, or
 - b. because you don't play well?
8. Suppose a person doesn't think you are very bright or clever.
 - a. Can you make him change his mind if you try to, or
 - b. Are there some people who will think you're not very bright no matter what you do?
9. If you solve a puzzle quickly, is it
 - a. because it wasn't a very hard puzzle, or
 - b. because you worked on it carefully?

10. If a boy or girl tells you that you are dumb, is it more likely that they say that
 - a. because they are mad at you, or
 - b. because what you did really wasn't very bright?
11. Suppose you study to become a teacher, scientist, or doctor and you fail. Do you think this would happen
 - a. because you didn't work hard enough, or
 - b. because you needed some help, and other people didn't give it to you?
12. When you learn something quickly in school, is it usually
 - a. because you paid close attention, or
 - b. because the teacher explained it clearly?
13. If a teacher says to you, "Your work is fine," is it
 - a. something teachers usually say to encourage pupils, or
 - b. because you did a good job?
14. When you find it hard to work arithmetic or math problems at school, is it
 - a. because you didn't study well enough before you tried them, or
 - b. because the teacher gave problems that were too hard?
15. When you forget something you heard in class, is it
 - a. because the teacher didn't explain it very well, or
 - b. because you didn't try very hard to remember?
16. Suppose you weren't sure about the answer to a question your teacher asked you, but your answer turned out to be right. Is it likely to happen
 - a. because she wasn't as particular as usual, or
 - b. because you gave the best answer you could think of?
17. When you read a story and remember most of it, is it usually
 - a. because you were interested in the story, or
 - b. because the story was well written?
18. If your parents tell you you're acting silly and not thinking clearly, is it more likely to be
 - a. because of something you did, or
 - b. because they happen to be feeling cranky?

19. When you don't do well on a test at school, is it
 - a. because the test was especially hard, or
 - b. because you didn't study for it?
20. When you win a game of cards or checkers, does it happen
 - a. because you play real well, or
 - b. because the other person doesn't play well?
21. If people think you're bright or clever, is it
 - a. because they happen to like you, or
 - b. because you usually act that way?
22. If a teacher didn't pass you to the next grade, would it probably be
 - a. because she "had it in for you," or
 - b. because your school work wasn't good enough?
23. Suppose you don't do as well as usual in a subject at school. Would this probably happen
 - a. because you weren't as careful as usual, or
 - b. because somebody bothered you and kept you from working?
24. If a boy or girl tells you that you are bright, is it usually
 - a. because you thought up a good idea, or
 - b. because they like you?
25. Suppose you became a famous teacher, scientist or doctor. Do you think this would happen
 - a. because other people helped you when you needed it, or
 - b. because you worked very hard?
26. Suppose your parents say you aren't doing well in your school work. Is this likely to happen more
 - a. because your work isn't very good, or
 - b. because they are feeling cranky?
27. Suppose you are showing a friend how to play a game and he has trouble with it. Would that happen
 - a. because he wasn't able to understand how to play, or
 - b. because you couldn't explain it well?

28. When you find it easy to work arithmetic or math problems at school, is it usually
- a. because the teacher gave you especially easy problems, or
 - b. because you studied your book well before you tried them?
29. When you remember something you heard in class, is it usually
- a. because you tried hard to remember, or
 - b. because the teacher explained it well?
30. If you can't work a puzzle, is it more likely to happen
- a. because you are not especially good at working puzzles, or
 - b. because the instructions weren't written clearly enough?
31. If your parents tell you that you are bright or clever, is it more likely
- a. because they are feeling good, or
 - b. because of something you did?
32. Suppose you are explaining how to play a game to a friend and he learns quickly. Would that happen more often
- a. because you explained it well, or
 - b. because he was able to understand it?
33. Suppose you're not sure about the answer to a question your teacher asks you and the answer you give turns out to be wrong. Is it likely to happen
- a. because she was more particular than usual, or
 - b. because you answered too quickly?
34. If a teacher says to you, "Try to do better," would it be
- a. because this is something she might say to get pupils to try harder, or
 - b. because your work wasn't as good as usual?

APPENDIX C

Bonnington-Jolly Attribution Scale for Children (ASC)

The examiner introduces the questionnaire by saying:

We're trying to see why some kids do OK in school, and why some kids don't do so good. I want to know what YOU think. We know, for instance, that some kids do better when they're interested in the subject. And of course some kids try hard and some kids don't try any. Sometimes the teacher likes them and sometimes she might not. Sometimes one person can help another out with something, and other times there could be noise that bothers the class, or a kid who bugs other kids and keeps them from doing their best. Sometimes a teacher might be picky, and sometimes she isn't. Maybe a kid does OK because he's smart. Maybe a kid doesn't understand that subject so he doesn't do so good. Then, how you feel can make a difference-- whether you feel good or whether you feel bad or sick or something. Some things are easy and some are hard. Maybe sometimes kids do well because they're lucky.

Anyway, I'm going to read some things to you and I want you to listen to all eight answers before you pick one. You can look at the question on this card while I read it to you. Pick the answer that best explains why it happened. For example,

(The examiner gives the following example to train the student)

One student didn't turn in his homework so he got a bad grade. Why didn't he turn in the work?

1. It was too hard.
2. He left it on the bus.
3. He didn't listen when the teacher said to do it.
4. He never turns in anything.
5. He didn't understand it.
6. He didn't feel good.
7. The teacher doesn't like him.
8. It was bad luck.

If the child wants to choose two answers, the examiner will say, "But which one is the most important?"

Bonnington-Jolly Attribution Scale
for Children (ASC)

1. (Ann/Jim) made an "A" on the test this week. Why did (s)he get an "A"?
 1. (Ann/Jim) was the teacher's pet.
 2. (Ann/Jim) always works hard.
 3. It was an easy test.
 4. (Ann/Jim) studied a lot the night before.
 5. (Ann/Jim) is smart.
 6. (Ann/Jim) was lucky.
 7. A friend helped.
 8. (Ann/Jim) felt like doing it.
2. Last week (s)he got a "C" on the test. Why do you suppose that grade was worse?
 1. It was harder.
 2. (Ann/Jim) didn't study.
 3. (Ann/Jim) couldn't think straight that day.
 4. Everybody did bad on that test.
 5. (Ann/Jim) didn't feel like it.
 6. Someone bothered (him/her).
 7. (Ann/Jim) wasn't interested.
 8. The teacher was too fussy.
3. That same day (Ann/Jim) got a very good grade in another class. Why did that happen?
 1. It was easy for (Ann/Jim).
 2. (Ann/Jim) paid attention to the teacher.
 3. (Ann/Jim) always turns in (his/her) papers.
 4. (Ann/Jim) understands all that stuff.
 5. A friend helped (him/her).
 6. (Ann/Jim) felt good.
 7. (Ann/Jim) is the teacher's pet.
 8. Everybody got a good grade.
4. Yesterday (Ann/Jim) had to do (his/her) worksheet over again. Why?
 1. (Ann/Jim) couldn't read the worksheet because it was messed up.
 2. The teacher was too fussy.
 3. (Ann/Jim) didn't listen to the teacher.
 4. (Ann/Jim) didn't like that subject.
 5. (Ann/Jim) was tired.
 6. (Ann/Jim) didn't understand it.
 7. Someone bugged (him/her).
 8. It was hard.

5. (Sally/Sam) got a special stamp for doing such good work on (his/her) worksheet. Why?
 1. The teacher thinks everything (s)he does is great!
 2. (Sally/Sam) always works hard.
 3. (Sally/Sam) was lucky enough to get a good copy of the paper.
 4. (Sally/Sam) felt like doing it.
 5. (Sally/Sam) is smart.
 6. (Sally/Sam) tried this time.
 7. It was easy.
 8. A friend helped (him/her).
6. (Sally/Sam) got a good grade in another subject too. Why?
 1. (Sally/Sam) is a good student.
 2. (Sally/Sam) took the book home to study.
 3. It is (his/her) favorite subject.
 4. (Sally/Sam) is the teacher's pet.
 5. It was real easy.
 6. (Sally/Sam) felt good.
 7. (His/Her) mom helped.
 8. (Sally/Sam) was just lucky.
7. (Sally, Sam) really messed up on a test. Why?
 1. (Sally/Sam) didn't study.
 2. (Sally/Sam) doesn't like that class.
 3. (Sally/Sam) has a bad memory.
 4. (Sally/Sam) was tired.
 5. The kid at the next desk was always bugging (him/her).
 6. It wasn't a fair test.
 7. The teacher is a grouch.
 8. It was bad luck.
8. (Jane/Joe) got the best grade in the class. Why?
 1. It is (Jane/Joe)'s favorite subject.
 2. (Jane/Joe) is smart.
 3. (Jane/Joe) is the teacher's pet.
 4. It is easy.
 5. It was good luck.
 6. (Jane/Joe) tried this time.
 7. (Jane/Joe) felt like doing it.
 8. A friend helped (her/her).

9. (Jane/Joe) got an awful bad grade on (his/her) project. Why?
1. (Jane/Joe) never finishes (his/her) work.
 2. (Jane/Joe) didn't try.
 3. The teacher has it in for (him/her).
 4. (Jane/Joe) is dumb.
 5. (Jane/Joe) felt bad.
 6. (His/Her) little brother bothered (him/her) so much that (s)he did a bad job.
 7. It was bad luck.
 8. It was hard.
10. (Jane/Joe) did a lot better in another class. Why?
1. (Jane/Joe) tried harder.
 2. (Jane/Joe) felt better.
 3. (Jane/Joe) understood how to do it.
 4. It was a lot easier to do.
 5. (Jane/Joe) was interested.
 6. (His/Her) little brother helped.
 7. Everybody got good grades.
 8. (Jane/Joe) is the teacher's pet.
11. (Ann/Jim) had to stay after school again to do (his/her) work. Why?
1. The teacher is a grouch.
 2. Everybody did bad that week.
 3. (Ann/Jim) never does (his/her) work.
 4. Schoolwork confuses (him/her). (S)He gets all mixed up.
 5. (Ann/Jim) didn't listen to the teacher.
 6. The work was too hard.
 7. (Ann/Jim) didn't feel like doing it.
 8. Someone bugged (him/her).
12. (Sally/Sam) has gotten a good grade on every test this year. Why?
1. (Sally/Sam) always does (his/her) work.
 2. (Sally/Sam) pays attention.
 3. (Sally/Sam) is smart.
 4. (Sally/Sam) is lucky.
 5. School is easy for (him/her).
 6. (Sally/Sam) is the teacher's pet.
 7. (Sally/Sam) felt like doing it.
 8. (His/Her) mom helped.

13. (Jane/Joe) got a special note from the teacher to tell (his/her) folks that (s)he was doing very good work in school this year. Why?
1. School is easy for (Jane/Joe).
 2. (Jane/Joe) always finishes (his/her) work.
 3. (Jane/Joe) is a good student.
 4. (Jane/Joe) is trying harder this year.
 5. The teacher thinks everything (s)he does is great.
 6. (Jane/Joe) feels better.
 7. Mom's been helping (him/her).
 8. It's just good luck.
14. (Jane/Joe) took forever to do the worksheet and then it was half wrong. Why?
1. (Jane/Joe) didn't know how to do it.
 2. The room was very noisy.
 3. The teacher was too fussy.
 4. (Jane/Joe) doesn't like that subject.
 5. (Jane/Joe) didn't try.
 6. It was hard.
 7. (Jane/Joe) had a headache.
 8. Nobody could read the worksheet.
15. (Sally/Sam)'s report card was real bad. Somebody said (s)he might flunk. Why is (Sally/Sam) flunking school?
1. Everybody bothers (him/her).
 2. The teacher is a grouch.
 3. (Sally/Sam) feels bad.
 4. (Sally/Sam) never does any work.
 5. It's bad luck.
 6. (Sally/Sam) is dumb.
 7. (Sally/Sam) doesn't listen to the teacher.
 8. The work is hard.
16. (Jane/Joe) had to stay in at recess to do (his/her) work because (his/her) paper was so bad. Why?
1. (Jane/Joe) is dumb.
 2. (Jane/Joe) didn't like doing it.
 3. (Jane/Joe) didn't try.
 4. (Jane/Joe) didn't feel like doing it right.
 5. The kid next to (him/her) bugged (Jane/Joe).
 6. It was hard.
 7. The teacher was too fussy.
 8. (Jane/Joe) had bad luck.

17. (Ann/Jim) got 100% on the test. Why?
1. (Ann/Jim) has a good memory.
 2. The teacher gave hints to the class.
 3. (Ann/Jim) studies a lot.
 4. It was easy test.
 5. (Ann/Jim) is interested in that class.
 6. (Ann/Jim) is the teacher's pet.
 7. (Ann/Jim) was lucky.
 8. (Ann/Jim) felt good.
18. (Sally/Sam) went into a higher group. Why?
1. Everybody changed groups.
 2. (Sally/Sam) is smart.
 3. (Sally/Sam) listened to the teacher.
 4. (His/Her) mom helped.
 5. School is easy for (Sally/Sam).
 6. (Sally/Sam) always works hard.
 7. (Sally/Sam) felt good.
 8. (Sally/Sam) is the teacher's pet.
19. (Jane/Joe) had to stay after school because (s)he didn't turn in (his/her) homework. Why didn't (s)he turn it in?
1. (Jane/Joe) didn't like the assignment.
 2. (His/Her) puppy ate the homework.
 3. (Jane/Joe) just didn't do it that time.
 4. (Jane/Joe) has a terrible memory.
 5. (Jane/Joe) was sick.
 6. It was hard.
 7. The teacher was a grouch.
 8. It was bad luck.
20. The next time homework was assigned (Sally/Sam) didn't turn it in on time. Why didn't (s)he?
1. Company came to visit.
 2. (Sally/Sam) never hands in (his/her) papers on time.
 3. (Sally/Sam) didn't listen when the class was told about it.
 4. (Sally/Sam) didn't feel like doing it.
 5. (Sally/Sam) was dumb.
 6. Nobody got it in on time.
 7. The teacher was a grouch.
 8. It was hard.

21. (Jane/Joe) turned (his/her) homework in at the right time, but (s)he didn't get a very good grade. Why?
1. (Jane/Joe) wasn't interested.
 2. The teacher was too fussy.
 3. (Jane/Joe) was tired.
 4. (Jane/Joe) can't understand it.
 5. (Jane/Joe) didn't try.
 6. It was hard.
 7. Nobody understood it.
 8. (His/Her) little sister colored all over it.
22. (Jane/Joe) got (his/her) paper posted on the "See What Good Work We Can Do" bulletin board. Why?
1. The teacher thinks everything (s)he does is super!
 2. (Jane/Joe) really worked awfully hard on it.
 3. It was easy.
 4. (Jane/Joe) is smart.
 5. Everybody's paper was posted.
 6. (Jane/Joe) always tries to do good work.
 7. (Jane/Joe) felt good.
 8. A friend helped (him/her).
23. (Ann/Jim) got a real good grade on the test. Why?
1. (Ann/Jim) is good in that subject.
 2. (Ann/Jim) is the teacher's pet.
 3. (Ann/Jim) tried this time.
 4. It was a really easy test.
 5. (Ann/Jim) always works hard.
 6. (Ann/Jim) just felt like doing it this time.
 7. The teacher gave the class hints.
 8. (Ann/Jim) was lucky.
24. (Sally/Sam) kept giving wrong answers in class yesterday. Why?
1. (Sally/Sam) wasn't interested.
 2. (Sally/Sam) didn't listen.
 3. The teacher is never satisfied with what (s)he says.
 4. (Sally/Sam) is dumb.
 5. (Sally/Sam) had a headache.
 6. Nobody else understood it either.
 7. It was too noisy in the room.
 8. It was hard.

21. (Jane/Joe) turned (his/her) homework in at the right time, but (s)he didn't get a very good grade. Why?
1. (Jane/Joe) wasn't interested.
 2. The teacher was too fussy.
 3. (Jane/Joe) was tired.
 4. (Jane/Joe) can't understand it.
 5. (Jane/Joe) didn't try.
 6. It was hard.
 7. Nobody understood it.
 8. (His/Her) little sister colored all over it.
22. (Jane/Joe) got (his/her) paper posted on the "See What Good Work We Can Do" bulletin board. Why?
1. The teacher thinks everything (s)he does is super!
 2. (Jane/Joe) really worked awfully hard on it.
 3. It was easy.
 4. (Jane/Joe) is smart.
 5. Everybody's paper was posted.
 6. (Jane/Joe) always tries to do good work.
 7. (Jane/Joe) felt good.
 8. A friend helped (him/her).
23. (Ann/Jim) got a real good grade on the test. Why?
1. (Ann/Jim) is good in that subject.
 2. (Ann/Jim) is the teacher's pet.
 3. (Ann/Jim) tried this time.
 4. It was a really easy test.
 5. (Ann/Jim) always works hard.
 6. (Ann/Jim) just felt like doing it this time.
 7. The teacher gave the class hints.
 8. (Ann/Jim) was lucky.
24. (Sally/Sam) kept giving wrong answers in class yesterday. Why?
1. (Sally/Sam) wasn't interested.
 2. (Sally/Sam) didn't listen.
 3. The teacher is never satisfied with what (s)he says.
 4. (Sally/Sam) is dumb.
 5. (Sally/Sam) had a headache.
 6. Nobody else understood it either.
 7. It was too noisy in the room.
 8. It was hard.

25. (Ann/Jim) got a good grade on (his/her) report card. Why?
1. (Ann/Jim) likes that subject.
 2. (Ann/Jim) is the teacher's pet.
 3. (Ann/Jim) is smart.
 4. That subject is easy for (Ann/Jim).
 5. (Ann/Jim) tried harder this time.
 6. The whole class got good grades.
 7. (His/Her) mom helped.
 8. (Ann/Jim) felt good.
26. (Jane/Joe) won the blue ribbon for (his/her) project for (his/her) grade. Why?
1. (Jane/Joe) was just lucky.
 2. It was (his/her) favorite subject.
 3. (Jane/Joe) worked hard on it.
 4. (Jane/Joe) is real smart.
 5. (Jane/Joe) is the teacher's pet.
 6. It was a real easy project.
 7. (Jane/Joe) felt like doing it.
 8. A friend helped (him/her).
27. (Sally/Sam) got a bad grade on one test. Why?
1. (Sally/Sam) was fed up with school.
 2. (Sally/Sam) couldn't do the work.
 3. (Sally/Sam) didn't try.
 4. (Sally/Sam) wasn't interested in it.
 5. It was too noisy in the room.
 6. It was too hard.
 7. It was just bad luck.
 8. The teacher was too fussy.
28. (Ann/Jim) got a bad grade on (his/her) work. Why?
1. (Ann/Jim) didn't read the assignment.
 2. (Ann/Jim) didn't understand it.
 3. (His/Her) little sister colored all over it.
 4. (Ann/Jim) doesn't like doing that kind of work.
 5. It was hard.
 6. The teacher didn't like it.
 7. (Ann/Jim) was sick.
 8. (Ann/Jim) was unlucky.

29. (Ann/Jim) got a bad grade in another subject too.
Why?
1. The teacher was too fussy.
 2. (Ann/Jim) wasn't interested.
 3. (Ann/Jim) didn't try.
 4. (Ann/Jim) can't understand all that stuff.
 5. The test wasn't fair.
 6. (Ann/Jim) had a bad cold that day.
 7. Someone bugged (him/her).
 8. It was bad luck.
30. (Sally/Sam) was the first to finish the test and the answers were all correct. Why did (Sally/Sam) do so well?
1. (Sally/Sam) took (his/her) book home to study last night.
 2. (Sally/Sam) studies ALL the time.
 3. (Sally/Sam) has a good memory.
 4. That subject is easy for (Sally/Sam).
 5. (Sally/Sam) was lucky.
 6. (Sally/Sam) felt good that day.
 7. (Sally/Sam) is the teacher's pet.
 8. A friend helped (him/her).

APPENDIX D

Criterion Group Means and Standard Deviations on the ASC

ON GROUPS DEFINED BY GRP GROUP 0 = SUCCESSFUL STUDENTS/GPA EQUAL TO OR GREATER THAN 2.0.

GROUP 1 = UNSUCCESSFUL STUDENTS/GPA LESS THAN 2.0

NUMBER OF CASES BY GROUP

GRP	NUMBER OF UNWEIGHTED	CASES WEIGHTED
0	79	79.0
1	16	16.0
TOTAL	95	95.0

GROUP MEANS

GRP	ASCS1	ASCS2	ASCS3	ASCS4	ASCS5	ASCS6	ASCS7	ASCS8
0	2.65323	8.51899	2.20253	.39241	.11392	.26586	.63291	.21519
1	2.25000	7.81250	2.00000	.62500	.68750	.68750	.68750	.25000
TOTAL	2.58347	8.40000	2.16842	.43158	.21053	.33684	.64211	.22105

GRP	ASCF1	ASCF2	ASCF3	ASCF4	ASCF5	ASCF6	ASCF7	ASCF8
0	1.26582	8.46835	1.91139	.69620	.07595	.81013	1.48101	.27848
1	1.81250	7.00000	1.43750	1.00000	.62500	1.37500	1.31250	.43750
TOTAL	1.35789	8.22105	1.83158	.74737	.16842	.90526	1.45263	.30526

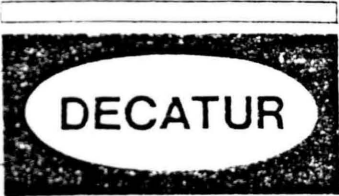
GROUP STANDARD DEVIATIONS

GRP	ASCS1	ASCS2	ASCS3	ASCS4	ASCS5	ASCS6	ASCF7	ASCF8
0	1.61531	2.96501	1.78584	.72355	.31975	.67385	2.27506	.59779
1	1.52753	3.97020	2.06559	1.40831	1.40099	1.13835	1.70171	.62915
TOTAL	1.60116	3.14338	1.82566	.87096	.66676	.78021	2.18198	.60272

GRP	ASCF1	ASCF2	ASCF3	ASCF4	ASCF5	ASCF6	ASCF7	ASCF8
0	1.36540	3.75478	1.56230	.99169	.26661	1.47697	1.02753	.67313
1	1.60378	3.89872	1.71148	1.21106	1.54380	2.06155	.87421	.57735
TOTAL	1.41358	3.79860	1.58888	1.03110	.69424	1.59169	.99910	.65524

APPENDIX E

School District Authorizations, Sample Parent
Letter, and Consent Form



DECATUR

ISD

NEAL B. SATTAWHITE, Superintendent

GRADY J. (BUD) ENIS, High School Principal
J. E. CARSON, Junior High School Principal
ROLAND WILSON, Middle School Principal
ALLEN R. YOUNG, Elementary School Prin.
DENA MORRIS, Tax Assessor-Collector

P. O. BOX 390 • DECATUR, TEXAS 76234

April 27, 1981

TO WHOM IT MAY CONCERN:

This is a letter of verification that Sondra Bonnington was given permission to use the Decatur Middle School for research purposes in preparation for writing her dissertation.

Sincerely,



Neal B. Sattawhite, Superintendent
Decatur Independent School District

nm

Ben Harmon

ASSISTANT SUPERINTENDENT

Lewisville Public Schools

436-4551

434-2006

1800 TIMBER CREEK RD.
P.O. BOX 217 - LEWISVILLE, TEXAS 75067

April 28, 1981

TO WHOM IT MAY CONCERN:

This is to advise you that the Lewisville Independent School District gave permission to SONDRA BONNINGTON to do a doctoral research study at Central Elementary School.

Ben Harmon
Assistant Superintendent

BH:ru

Carrollton Farmers Branch
Independent
School District



Telephone
Area Code 214 213-2217

May 6, 1981

Sandra Bonnington
3318 Valley View Rd.
Denton, Texas

Dear Sandra:

The Research Screening Committee has approved your study. Under our school board policy, we allow the building principal to elect or not to elect to participate.

George Shelley at Central Elementary and Marie Huie at McLaughlin Elementary have both agreed to talk with you and see if they want to participate in your study. Feel free to contact them at their buildings.

Best of luck with your work. Please keep me informed as to the progress of the study. We also require a copy of the finished product for our libraries.

Sincerely,

M. Tim Grady, Ph.D.
Coordinator of Secondary Curriculum

MG:sa

Sample Parent Letter

Dear Parents,

Your child is being asked to join in a study which, when completed, can give valuable information to the teachers and administrators of the public schools. The study will try to identify which attitudes are most directly connected with academic achievement.

If your consent is given, your child will be given two questionnaires which ask the child to select one of the given options as the most important cause of that particular school happening. The questionnaires will be administered individually and take about half an hour to complete. This will be done during regular school time. The child will look at a written copy of the questions as they are listened to on a tape recorder, and then give his or her opinion as to the cause of that situation. These scores will be compared with each other and with his or her grade point average, but only group scores will be used in the analysis of this data. Your child's name and the school's name will not be used in the release of any data.

The questionnaires will be given by trained examiners under my direction, or by me, Sondra Bonnington M.Ed., doctoral candidate as the research requirement for my dissertation. I can be reached from 7:00 to 10:00 p.m. Monday through Friday at (817) 382-1946 (you may call collect). During the day, from 8:00-5:00, I can be reached or you can leave a message for me, at (817) 382-5536. The results of the research will be helpful in deciding what steps to take to facilitate academic achievement in children who are having difficulty with motivation.

Your child's participation in the research is voluntary. Any questions you have will be answered before the questionnaires are given. If you would like your child to participate, please sign the enclosed form and return it to the school.

Sincerely,

Sondra Bonnington, M.Ed.

Consent Form: TEXAS WOMAN'S UNIVERSITY, HUMAN SUBJECTS
REVIEW COMMITTEE

(Form B)

Title of Project: AN INVESTIGATION OF THE RELATIONSHIPS
BETWEEN ATTRIBUTIONS FOR SUCCESS AND FAILURE AND ACADEMIC
ACHIEVEMENT OF FOURTH GRADE NON-HANDICAPPED AND LEARNING
DISABLED BOYS AND GIRLS

Consent to Act as a Participant for Research and
Investigation:

I have received a written description of this study,
including a fair explanation of the procedures and their
purpose, any associated discomforts or risks, and a
description of the possible benefits. An offer has been
made to me to answer all questions about the study. I
understand that my child's name will not be used in any
release of data and that he/she is free to withdraw at
any time. I further understand that no medical service
or compensation is provided to subjects by the University
as a result of injury from participation in research.

Parent's signature

Date

Participant is a minor (age _____)

Participant's signature

Date

APPENDIX F

Approval from TWU Human Research
Review Committee

TEXAS WOMAN'S UNIVERSITY
Box 23717 TWU Station
Denton, Texas 76204

HUMAN SUBJECTS REVIEW COMMITTEE

Name of Investigator: Sondra Bonnington Center: Denton
Address: 1328 Valley View Road Date: April 20, 1981
Denton, TX 76201

Dear Ms. Bonnington,

Your study entitled An Investigation of the Relationships Between Locus of Control, Attributions for Success and Failure, and Academic Achievement of Fourth Grade Non-Handicapped and Learning Disabled Boys and Girls

has been reviewed by a committee of the Human Subjects Review Committee and it appears to meet our requirements in regard to protection of the individual's rights.

Please be reminded that both the University and the Department of Health, Education, and Welfare regulations typically require that signatures indicating informed consent be obtained from all human subjects in your studies. These are to be filed with the Human Subjects Review Committee. Any exception to this requirement is noted below. Furthermore, according to DHEW regulations, another review by the Committee is required if your project changes.

Any special provisions pertaining to your study are noted below:

X Add to informed consent form: No medical service or compensation is provided to subjects by the University as a result of injury from participation in research.

 Add to informed consent form: I UNDERSTAND THAT THE RETURN OF MY QUESTIONNAIRE CONSTITUTES MY INFORMED CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH.

 The filing of signatures of subjects with the Human Subjects Review Committee is not required.

 Notes: Children 6 years of age and older must also sign the consent form. If you are not using Form B: oral consent, add statement checked above to your consent form.

 No special provisions apply.

Associate Provost
Vice President
Director of School of
Chairman of Department

Sincerely,

Marilyn Hinson

Chairman, Human Subjects
Review Committee

at Denton

APPLICATION TO HUMAN SUBJECTS REVIEW COMMITTEE

Subject: Research and Investigation Involving Humans

Statement by Program Director and Approved by Department Chairman

This abbreviated form is designed for describing proposed programs in which the investigators consider there will be justifiable minimal risk to human participants. If any member of the Human Subjects Review Committee should require additional information, the investigator will be so notified.

Five copies of this Statement and a specimen Statement of Informed Consent should be submitted at least two weeks before the planned starting date to the chairman or vice chairman on the appropriate campus.

Title of Study: AN INVESTIGATION OF THE RELATIONSHIPS BETWEEN LOCUS OF CONTROL, ATTRIBUTIONS FOR SUCCESS AND FAILURE, AND ACADEMIC ACHIEVEMENT OF FOURTH GRADE NON-HANDICAPPED AND LEARNING DISABLED BOYS AND GIRLS.

Program Director (s): Dr. Chester E. Gorton
Department of Special Education

Graduate Student: Sondra Bonnington

Estimated beginning date of study: April 20, 1981

Estimated duration: 4 weeks

Address where approval letter is to be sent:

3328 Valley View Road
Denton, TX 76201

Is this research being conducted for the thesis or professional paper?
 Y N ; for the dissertation? Y yes N .

-2-

1. Brief description of the study (use additional pages or attachments, if desired, and include the approximate number and ages of participants, and where they will be obtained).

(see attached sheet)

2. What are the potential risks to the human subjects involved in this research or investigation? "Risk" includes the possibility of public embarrassment and improper release of data. Even seemingly nonsignificant risks should be stated and the protective procedures described in #3 below.

No risk is foreseen in the voluntary participation in the testing program. All names will be coded and no school or individual will be identified by name in the final reporting of data. Minimal amounts of time are involved by individual participants. Testing will be conducted in an area designated by the school principal.

3. Outline the steps to be taken to protect the rights and welfare of the individuals involved.
 1. Written permission will be obtained prior to test administration from all necessary parties.
 2. Both questionnaires will be administered by the researcher.
 3. All response sheets will be coded to protect names of individuals.
 4. Test analysis of the collected data will be retained by the researcher.
 5. Analysis of data will involve group scores. No individual or score from the person legally responsible for the subjects. Attach documents, will be from the person legally responsible for the subjects. These may be properly executed, revealed, i.e., a specimen informed consent form. These may be properly executed, revealed, through completion of either (a) the written description form, or (b) the oral description form. Specimen copies are available from departmental chairmen. Other forms which provide the same information may be acceptable. A written description of what is orally told to the subject must accompany the oral form in the application.

A written permission form which incorporates the requisites in Form B will be obtained from parents/guardians and the child and retained on file by the primary researcher. The school district may request that the written description form and the permission form to parents/guardians be sent under the heading of the school district.

-3-

5. If the proposed study includes the administration of personality tests, inventories, or questionnaires, indicate how the subjects are given the opportunity to express their willingness to participate. If the subjects are less than the age of legal consent, or mentally incapacitated, indicate how consent of parents, guardians, other qualified representatives will be obtained.

Participation will be voluntary. The attached written permission form will be obtained from the parent or guardian. This form includes written release from the child. Should a child change his or her mind, he or she will be excused from the testing and a replacement drawn from an available pool of subjects.

Signature of
Approval

James E. Fitch
Program Director

Date 4-6-81

Signature of
Approval

Londra Bonnington
Graduate Student

Date 4-6-81

Signature of
Approval

E. C. Watkins
Dean, Department Head or Director

Date 4-6-81

Date received by Committee Chairman: _____

1. Brief description of the study:

Boys and girls between the ages of 9-0 and 10-6 as of January 1, 1981, in fourth grade classes, will comprise the research pool. There will be 100 participants, 50 boys and 50 girls. Half (50) will be classified as non-handicapped (NH): There will be 25 NH boys and 25 NH girls. The other half (50) will be learning disabled (LD) children. There will be 25 LD girls and 25 LD boys. Socioeconomic status will be allowed to vary. Race of subjects will be restricted to Caucasian. Hearing and vision will be within normal limits. The research sample will be drawn from selected school districts in the Dallas/Ft. Worth Metroplex area of North Texas.

Two questionnaires will be individually administered to each child in the research sample. Group means will be used. Raw data points will be compared with grade point averages to determine if any significant relationships exist. Analysis of data will involve group scores.

Both questionnaires will be recorded on a cassette tape and played to the student. The student will also be given a typed form of the questionnaire to read along with the tape if he or she so wishes. The Intellectual Achievement Responsibility Questionnaire (IAR) specifically measures internal locus of control in academic situations. It is a 35 item forced-choice questionnaire. The Bonnington-Jolly Attribution Scale for Children (ASC) is a 30 item questionnaire. Each stem is followed by eight possible responses. The child will be asked to pick the most important cause of that particular outcome, in order to identify the child's attributions for academic successes and failures.

Testing will be conducted in an area designated by the school principal as a setting appropriate for individual testing. Test times will be scheduled so as not to compete with other school activities or holiday periods in order that students would have the maximum opportunity to attend. The participation of the children will be voluntary.

APPENDIX G

Raw Data Collected in the
Dissertation Research

KEY to Column Identification

<u>Column</u>	<u>Item</u>
I.	Number assigned to subject
II.	Grade Point Average
III.	IAR I+ score
IV.	IAR I- score
V.	1-3 ASC scores for success (ASCS) 1. typical effort--diligence 2. immediate effort--tried 3. ability--smart 4. mood, feeling good 5. teacher bias for 6. unusual help 7. easy task 8. good luck
VI.	1-3 ASC scores for failure (ASCF) 1. typical effort--lazy 2. immediate effort--didn't try 3. ability--dumb 4. mood--feeling bad 5. teacher bias against 6. unusual hindrance 7. hard task 8. bad luck

Non-Handicapped Boys

I	GPA	IAR		ASCS								ASCF							
	II	III	IV	V								VI							
				1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	3.49	14	12	3	6	3	0	0	0	3	0	4	6	2	3	0	0	0	0
2	2.44	16	12	3	8	4	0	0	0	0	0	1	12	2	0	0	0	0	0
3	2.33	13	10	4	10	0	1	0	0	0	0	0	13	1	1	0	0	0	0
4	3.05	14	13	4	5	5	1	0	0	0	0	2	8	5	0	0	0	0	0
5	.66	11	11	4	4	2	5	0	0	0	0	3	4	3	4	0	1	0	0
6	3.72	15	10	0	15	0	0	0	0	0	0	0	7	0	1	0	6	0	1
7	2.77	14	11	2	5	4	3	0	0	1	0	0	3	3	5	0	0	4	0
8	3.11	15	10	3	9	3	0	0	0	0	0	5	4	1	1	0	0	4	0
9	2.93	17	11	3	8	4	0	0	0	0	0	4	8	2	0	0	0	1	0
10	2.50	16	15	3	10	1	1	0	0	0	0	1	11	2	1	0	0	0	0
11	2.66	15	11	5	6	2	1	1	0	0	0	0	2	2	2	0	6	3	0
12	2.11	14	9	2	9	3	0	0	0	1	0	4	11	0	0	0	0	0	0
13	2.38	13	13	3	7	2	0	0	1	2	0	0	4	1	0	0	4	6	0
14	2.88	11	10	1	13	1	0	0	0	0	0	0	6	4	0	0	0	4	1
15	2.61	14	9	3	9	2	1	0	0	0	0	0	6	4	1	0	3	1	0
16	1.72	14	15	1	14	0	0	0	0	0	0	0	14	0	0	0	1	0	0
17	2.38	13	13	4	8	3	0	0	0	0	0	1	10	1	0	0	1	2	0
18	3.44	12	9	0	6	6	1	0	0	2	0	2	8	1	1	0	0	2	1
19	3.44	13	11	2	13	0	0	0	0	0	0	0	12	0	1	0	2	0	0
20	2.88	13	13	2	11	1	0	0	1	0	0	1	12	1	0	0	1	0	0
21	3.55	15	13	2	10	1	0	0	0	2	0	0	2	2	0	0	0	11	0
22	3.33	11	11	0	8	3	3	1	0	0	0	3	8	0	2	0	1	1	0
23	3.89	14	8	4	10	1	0	0	0	0	0	2	12	1	0	0	0	0	0
24	4.00	16	13	3	12	0	0	0	0	0	0	1	14	0	0	0	0	0	0
25	2.38	14	9	5	6	2	1	1	0	0	0	2	1	2	2	1	5	1	1
26	3.67	10	11	1	11	1	0	0	0	2	0	1	6	1	1	1	0	5	0
27	3.67	16	7	5	4	6	0	0	0	0	0	1	8	5	0	0	0	1	0

Non-handicapped Girls

I	GPA	IAR		ASCS								ASCF							
	II	III	IV	V								VI							
				1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	1.50	8	8	3	3	5	1	2	0	1	0	2	0	3	3	4	0	2	1
2	3.61	14	11	3	7	5	0	0	0	0	0	1	7	2	1	0	1	3	0
3	3.55	13	13	4	3	3	0	0	0	0	0	0	10	2	0	0	0	3	0
4	1.00	11	10	6	7	2	0	0	0	0	0	0	10	4	0	0	0	1	0
5	.66	15	15	4	8	2	1	0	0	0	0	2	13	0	0	0	0	0	0
6	3.94	16	15	0	14	0	0	0	1	0	0	0	12	2	1	0	0	0	0
7	3.61	16	14	2	11	2	0	0	0	0	0	0	13	2	0	0	0	0	0
8	3.21	15	12	3	7	4	0	0	0	1	0	0	11	2	1	1	0	0	0
9	3.00	12	12	1	9	2	2	0	0	1	0	2	8	3	1	0	0	1	0
10	1.77	13	12	2	13	0	0	0	0	0	0	0	10	3	0	0	1	1	0
11	3.50	14	12	4	7	1	0	0	0	3	0	5	5	3	1	0	0	1	0
12	2.11	12	11	2	12	1	0	0	0	0	0	1	12	0	0	0	0	1	1
13	3.28	12	9	4	11	0	0	0	0	0	0	1	14	0	0	0	0	0	0
14	1.66	12	11	1	12	0	0	0	0	2	0	1	7	1	0	1	0	4	1
15	2.05	13	8	6	6	2	0	0	0	1	0	1	8	2	0	0	3	0	1
16	2.66	17	15	1	12	1	1	0	0	0	0	1	13	0	1	0	0	0	0
17	2.88	16	13	2	10	3	0	0	0	0	0	0	15	0	0	0	0	0	0
18	3.11	16	10	5	9	1	0	0	0	0	0	1	6	4	0	0	4	0	0
19	2.61	13	11	3	11	0	0	0	0	0	1	2	11	0	0	0	0	1	1
20	2.44	13	12	2	12	1	0	0	0	0	0	1	11	2	0	0	0	1	0
21	3.44	14	12	3	11	1	0	0	0	0	0	3	10	2	0	0	0	0	0
22	2.66	13	9	4	8	1	0	0	0	2	0	1	5	3	0	0	0	6	0
23	2.22	10	8	2	5	2	3	0	1	2	0	1	4	1	1	0	3	4	0
24	2.61	15	15	2	12	1	0	0	0	0	0	3	12	0	0	0	0	0	0
25	3.11	17	14	2	12	0	1	0	0	0	0	1	11	2	0	0	0	0	1

Non-handicapped Girls (continued)

I	GPA	IAR		ASCS								ASCF							
	II	III	IV	V								VI							
				1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
26	3.78	14	7	0	7	6	0	0	0	2	0	2	12	0	0	0	0	1	0
27	4.00	17	11	1	9	4	1	0	0	0	0	0	13	2	0	0	0	0	0
28	4.00	16	12	1	11	3	0	0	0	0	0	0	13	1	0	0	0	1	0
29	4.00	14	12	1	9	5	0	0	0	0	0	0	12	2	0	0	0	1	0
30	4.00	13	11	5	8	1	1	0	0	0	0	7	6	0	2	0	0	0	0
31	3.89	14	13	1	7	6	1	0	0	0	0	1	7	4	0	0	3	0	0
32	3.22	13	12	2	11	0	0	1	1	0	0	2	12	0	0	0	0	1	0
33	3.33	17	10	1	4	7	0	0	0	3	0	1	5	3	0	0	0	6	0
34	2.27	16	9	4	7	4	0	0	0	0	0	2	5	3	1	1	2	1	0
35	2.38	11	7	1	10	2	0	0	0	1	1	2	9	2	1	0	1	0	0

Learning Disabled Boys

I	GPA	IAR		ASCS								ASCF							
	II	III	IV	V								VI							
				1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	1.61	12	13	2	5	6	0	0	1	1	0	1	6	4	0	0	2	0	2
2	3.13	12	9	2	7	3	1	1	1	0	0	0	0	3	0	0	0	11	1
3	2.66	15	16	1	12	2	0	0	0	0	0	0	9	2	1	0	2	1	0
4	2.66	12	11	2	8	4	0	0	1	0	0	2	4	4	1	0	0	4	0
5	2.50	13	15	0	13	1	0	0	1	0	0	2	12	1	0	0	0	0	0
6	1.83	15	13	2	12	0	0	0	0	1	0	4	9	0	2	0	0	0	0
7	2.11	11	12	2	8	3	0	0	0	0	2	1	9	1	3	0	0	0	1
8	2.77	10	12	3	2	1	1	0	1	4	3	0	6	2	2	0	2	1	2
9	.33	12	12	2	10	3	0	0	0	0	0	6	8	0	1	0	0	0	0
10	2.93	16	10	7	3	2	1	0	0	1	1	1	6	2	1	0	0	5	0
11	2.88	15	12	3	8	4	0	0	0	0	0	1	10	0	0	0	1	0	3
12	1.66	14	14	1	9	2	0	0	2	1	0	2	3	0	1	0	7	2	0
13	2.78	11	8	3	4	5	1	0	1	1	0	1	3	8	0	0	0	2	1
14	2.88	13	10	5	6	1	0	0	0	3	0	1	8	2	0	0	0	3	1
15	1.73	14	8	3	9	1	0	0	2	0	0	3	7	1	1	0	3	0	0
16	1.66	9	6	1	5	6	0	2	0	0	1	2	7	0	0	0	0	5	1
17	1.94	13	8	0	10	0	0	0	4	1	0	1	9	4	1	0	0	0	0
18	2.55	13	14	3	5	3	0	0	3	1	0	1	14	0	0	0	0	0	0
19	2.38	12	13	3	6	3	1	1	0	1	0	3	3	5	2	1	0	0	1
20	2.05	9	9	4	7	4	0	0	0	0	0	1	6	5	0	0	3	0	0
21	2.22	13	14	3	9	2	0	0	1	0	0	2	9	3	0	0	1	0	0

Learning Disabled Girls

I	GPA	IAR		ASCS								ASCF							
	II	III	IV	V								VI							
				1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	2.05	11	9	5	0	3	0	1	0	3	3	2	2	4	3	0	2	0	2
2	1.87	13	13	1	3	1	0	5	1	3	1	1	2	0	2	0	5	4	1
3	2.25	14	12	1	13	0	0	1	0	0	0	0	14	0	1	0	0	0	0
4	2.38	11	9	5	7	0	0	1	1	0	1	1	4	3	1	0	4	2	0
5	2.77	15	15	2	13	0	0	0	0	0	0	0	15	0	0	0	0	0	0
6	1.86	6	7	3	1	2	3	2	1	1	2	1	3	0	1	5	2	2	1
7	2.79	14	11	1	8	2	1	0	0	1	2	1	5	2	2	0	0	3	2
8	2.66	13	6	0	12	0	0	0	0	3	0	2	7	3	0	0	0	3	0
9	2.66	13	13	5	6	2	2	0	0	0	0	0	9	2	2	0	1	1	0
10	2.66	9	14	2	6	2	0	0	4	1	0	0	13	2	0	0	0	0	0
11	2.66	9	9	3	5	0	0	0	2	2	3	0	5	3	3	1	0	3	0
12	3.11	15	15	6	9	0	0	0	0	0	0	1	10	2	0	0	2	0	0

APPENDIX H

Example of the Computation of a Discriminant Score

The unstandardized canonical discriminant function coefficients (Table 12) are used with raw scores. The formula for a discriminant score (DS) is:

$$\begin{aligned} DS = & -.1020308 (ASCS2) + -.9736476 (ASCS5) \\ & + -.6808257 (ASCS6) + -.3044939 (ASCF1) \\ & + -.7991113 (ASCF5) + 1.839426 \end{aligned}$$

Entering the raw scores from the ASC, as given in the example, this becomes:

$$\begin{aligned} DS = & -.1020308 (15) + -.9736476 (0) \\ & + -.6808257 (0) + -.3044939 (2) \\ & + -.7991113 (0) + 1.839426 \\ = & -1.530462 + 0 + 0 + -.6089878 + 0 + 1.839426 \\ = & -2.1394498 + 1.839426 \\ = & -.3000238 \end{aligned}$$

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