1984

Locus Of Control As A Predictor Of Academic Learning Time

David A. Markwell
University of the Pacific

LOCUS OF CONTROL AS A PREDICTOR OF ACADEMIC LEARNING TIME

A Dissertation

Presented to

the Faculty of the Graduate School

University of the Pacific

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

---

by

David A. Markwell

December 21, 1984

This dissertation, written and submitted by

David A. Markwell

is approved for recommendation to the Committee on Graduate Studies, University of the Pacific

Dean of the School or Department Chairman:

L B Hursley

Dissertation Committee:

Bobby R Hopkins Chairman

Mari G. Lewis

Robert D. Marrett

K E Reeves

M. Lewis Thorn

Dated October 19, 1984

Acknowledgements

The completion of this dissertation has been possible only because of the support and encouragement given to the author by a great many people. For this reason, I would sincerely like to thank Dr. Bobbie Hopkins, who chaired my committee and provided many valuable insights and suggestions; Winnie Kammerzell and Cheryl Merriman, who provided repeated editorial comments and patient typings of the manuscripts; and Teresa, Shelley, and Paul, my family, who have done without many things while "daddy" has had to study and work.

Abstract

This dissertation examined the relationship between locus of control (for all, positive, and negative events) and rate of academically engaged learning time (for mathematics and language arts separately and together) and how this relationship is affected by the sex, ethnicity, socio-economic status and achievement of the student and the grade and instructional organization of the school. The subjects for this investigation consisted of 56 fourth grade students at two year-around schools in Watsonville, California. This sample included the following approximate proportions: males-60%; low socio-economic status (qualified for free or reduced lunches) 50%; and Hispanic-60%. Data gathering was accomplished by reviewing school records, administering the Intellectual Achievement Responsibility scale, and two independent observers using the Beginning Teachers Evaluation Study classroom behavior rating scale. Data analysis consisted of Pearson Product-Moment and partial correlations and analyses of variance.

Although 126 hypotheses were studied, only 5 of these hypotheses resulted in statistically significant results. Three of the five statistically significant findings suggest an inverse relationship between locus of control for negative events and rate of academically engaged learning time in self-directed instruction when students' ethnicity is controlled. Because of the limited number of statistically significant results, the study concluded there was little evidence to support the existance of a significant or meaningful relationship between locus of control and rate of academically engaged learning time. Recommendations for further study were limited to only the examination of the possible existence of this relationship within ethnic groupings.

TABLE OF CONTENTS

Chapter 1

Introduction

The research in the field of educational psychology is replete with studies on the variables leading toward effective instruction and learning. This research has generally emphasized the study of learner attributes and their relationship to specific cognitive goals. Recently, a new emphasis has been given to the concepts of mastery learning and how the rate of academically engaged learning time affects this mastery. This dissertation will focus on the yet unstudied relationship between a learner attribute, specifically locus of control, and rate of academically engaged learning time.

Background Information

The concept of locus of control is based on the work of Rotter (1954, 1964, 1972, 1975) who has attempted to integrate stimulus-response with cognitive theories of behavior. Accordingly, people who perceive reinforcements as being contingent upon their own behavior are considered to exhibit an internal locus of control. Those who perceive reinforcements as due to factors outside of their control are considered to demonstrate an external locus of control. These perceptions of control are theorized to vary in degree along an internal/external

continuum. In recent years, measures of locus of control have been found to be related to a wide variety of behaviors related to academic achievement. These relationships have included test scores, grade-point averages, placement in learning disability programs, utilization of time, persistence, expectations of success, motivational levels, and ability to delay gratification.

Similarly, the concept of academically engaged learning time is founded on the work of Carroll (1963) who made time a central factor in his discussion. Although many people have contributed to this area, the work of Fisher et al. (1978) led to the finding that academic learning time was of primary importance in predicting ultimate academic achievement.

Purpose of study

The purpose of this study is to investigate the relationship between locus of control and academically engaged learning time. As indicated, previous work has demonstrated significant relationships between each of these variables and academic learning; yet, no research has been found that directly studied the relationship between these variables.

The significance of this investigation is primarily in its attempt to relate a specific student characteristic to students' academically engaged learning time. Currently, the educationally oriented professional

literature focuses on the importance of academically engaged learning time to the mastery of learning specific content and on the instructional behaviors teachers can enact to increase this time. Similarly, the psychologically oriented professional literature focuses on the possible benefits and liabilities a positive level of internality has in terms of an individual's ultimate adjustment. The potentiality of directly relating students' loci of control to their rates of academically engaged learning time is associated with the question of to what degree students' ultimate level of academic learning is due to their perception of self-responsibility rather than to their teachers' instructional techniques.

Questions to be Answered

This investigation attempts to answer the following general question:

> What is the relationship between locus of control (for all, positive, and negative events) and rate of academically engaged learning time (for mathematics and language arts separately and together) and how is this relationship affected by the sex, ethnicity, socio-economic status, and achievement of the student.

As the reader will discover in chapter 3, this general question will also be analyzed in terms of the effect school organization has upon the relationship due to the significant difference between the way the two schools utilized in the sample were organized. These organizational differences focused primarily on their

grade-level structure, (i.e., single- versus multi-graded classrooms), and instruction, (i.e., self-contained versus departmentalized classes).

More specifically, this general question will be divided into nine major hypotheses that allow for all permutations of locus of control for all, positive, and negative events to be correlated to all permutations of mathematics and language arts separately and together. Each of these nine hypotheses will be followed by five corollaries studying the effect each of the five controlling variables has upon the general relationship.

Significance of the Study

As previously stated, a great deal of work has been occurring in the fields of locus of control and academically engaged learning time. Yet, direct studies of the relationships between these two important areas have not been found. The result of reviewing the professional literature has been to derive the following findings:

1) A positive, but not extreme, level of internality will facilitate students' overall levels of adjustment, part of which is their level of academic learning.
2) Positive rates of academically engaged learning time will facilitate students' resultant levels of academic learning.

3) The exhibition of certain specific instructional behaviors by teachers will facilitate students' rates of academically engaged learning time.

Missing from these findings is the role and responsibility of the students themselves. Specifically, to what degree do certain student characteristics affect their rate of academically engaged learning time? The significance of this study is to directly investigate this question by correlating locus of control (a variable repeatedly associated with academic tests, grade-point averages, etc.) with rates of academically engaged learning time. As such, the study's significance is intimately related to the importance of academic learning, to the rate of academically engaged learning time, and to the level of responsibility appropriately assigned to students in the learning process.

Remaining Chapters

The remainder of this dissertation will present the reader with a literature review and the findings and implications of this study. As such, it is divided into four remaining chapters.

Chapter 2 focuses on a comprehensive review of the professional literature. The first part presents information about locus of control-- its theoretical derivations and major relationship to academic learning. The second section presents information about time, the

utilization of time in theories related to academic learning, and some of the empirical relationships that have been found between time and academic learning.

Chapter 3 outlines the research methodology used in this study. As such, it describes the sample used, the instruments administered, the gathering of data, the operational hypotheses and their corollaries, and how the data were analyzed.

Chapter 4 presents the actual analysis of the data and a discussion of their implications. The analysis is provided according to each hypothesis and corollary. The discussion brings together the present findings and discusses their relationship one to another and then to the rest of the professional literature.

Chapter 5 provides the reader with an overall summary of the study, the author's conclusions, and implications of this study's findings compared to those in the professional literature.

Chapter 2

Review of the Literature

This chapter will focus on reviewing the pertinent literature regarding locus of control and engaged time. As such, attention will first be given to locus of control--an overview of social learning theory, the definition of locus of control and academic achievement, and the relationship between locus of control and behaviors related to achievement. Attention will then be given to engaged time--an overview of time as a research variable, theories regarding time and achievement, and definitions of time and the relationships between these definitions and achievement.

Overview of Social Learning Theory

Social learning theory has attempted to integrate stimulus-response, or reinforcement, theory with cognitive, or field, theories of behavior (Rotter, 1975). According to this perspective, four concepts are central in predicting and explaining behaviors: behavior potential, expectancy, reinforcement value, and psychological situation.

Behavior potential refers to the potential or probability of an individual enacting any specific behavior in reference to the repertory of behaviors that

that individual is capable of performing. The individual's perception of the situation in which the behavior is to occur and the possible reinforcements likely to result are important in determining the potential of an individual selecting one behavior or set of behaviors rather than another behavior or set of behaviors (Rotter et al., 1972).

Expectancy is defined as the probability that a specific reinforcement will occur following the enactment of any specific behavior. Here again, it is the individual's perception of this probability within the context of a specific situation that is important (Rotter et al., 1972).

Reinforcement value refers to an individual's preference for one specific reinforcement in relationship to all reinforcements possible. It is important to note that this value considers the expectancy of all reinforcers to be equal (Rotter et al., 1972).

Psychological situation is defined as the individual's perception of both internal and external stimulation to which the behavior is enacted. It is because these internal and external stimuli interact and affect each other that emphasis is placed on psychological situation rather than stimulus (Rotter et al., 1972).

Rotter et al. (1972) have developed a general formula that brings together the basic concepts of behavior potential, expectancy, reinforcement value,

and psychological situation:

$$BP_{(x-n),s_{(1-n)},R_{(a-n)}} = f \; E_{(x-n)s_{(1-n)},R_{(a-n)}} \; \& \; RV_{(a-n),s_{(1-n)}}$$

This formula states that

> the potentiality of functionally related behaviors x to n to occur, in specified situations 1 to n in relation to potential reinforcements a to n, is a function of the expectancies of these behaviors leading to these reinforcements in these situations and the values of these reinforcements in these situations. (p. 14)

In reviewing these definitions and this formula, the reader can easily see the emphasis in social learning theory is on the individual's perception and reaction. Yet, Rotter et al. (1972) repeatedly indicate that since there is commonality among individuals of the same culture and generality across time, there is also reliability. This combination of idiosyncratic and nomothetic dimensions of learning results in the integration of reinforcement and field theories represented by social learning theory.[1]

Definition of Locus of Control

The concept of locus of control, as discussed in several major reviews, for example, Joe (1971), Lefcourt (1966), Rotter (1966, 1975), and Rotter, Seeman, and Leverant (1962), stresses the importance of expectancies in social learning theory. Following Lewin's (1935)

[1] For more complete reviews of social learning theory the reader is referred to Lefcourt (1966, 1976), Phares (1976), Rotter (1954, 1966), and Rotter et al. (1972).

earliest work, Rotter (1966) emphasized that a major determinant in the effect of reinforcement upon learning depends upon

> the degree to which the individual perceives that the reward follows from, or is contingent upon, his own behavior or attributes versus the degree to which he feels the reward is controlled by forces outside of himself and may occur independently of his own actions. (p. 1)

An individual's perception is generally described as being somewhere along a continuum ranging from an internal to an external locus of control. Again, Rotter (1966) stated:

> A perception of causal relationship need not be all or none but can vary in degree. When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his own action, then in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the forces surrounding him. When the event is interpreted in this way by an individual, we have labeled the belief in <u>external control</u>. If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in <u>internal control</u>. (p. 1)

Emphasizing the need to consider the situation in which the individual's locus of control is evidenced, both Lefcourt (1981) and Nowicki (1976) suggest maximum significance is achieved by moving from Rotter's generalized expectancy described above to specific expectancies defined by specific situations being encountered. For example, in this study external control is attributed to teachers, level of task difficulty, luck, and so forth, rather than to the broad or general variables

identified by Rotter.

Locus of Control and Academic Achievement

The relationship between locus of control and academic achievement has been repeatedly examined. These studies have focused on both global and specific measures of locus of control, (i.e., investigating the relationship to levels of total internality as well as to internality of positive and/or negative events), and academic achievement as indicated by tests and grade point averages.

In general, the level of internality is positively related to academic achievement. More specifically, the greater the level of internality for positive, negative, and all events, the greater the level performance on academic tests and the higher the grade point average. This relationship appears to be stronger for males than females (Barnett & Kaiser, 1978; Clifford & Cleary, 1972; Crandall, Katkovsky, & Crandall, 1965; Crandall, Katkovsky, & Preston, 1962; Gordon, 1977; McGhee & Crandall, 1968; Neilson & Long, 1981; Nowicki, 1976a; Sherman & Hofmann, 1980; Wolfgang & Potvin, 1973), for older than younger students (Crandall et al., 1965), and for grade point average than test performance (Crandall et al., 1965; Gordon, 1977; Kanoy, 1980; Messer, 1972; McGhee & Crandall, 1968; Nowicki, 1976; Sherman & Hofmann, 1980). A further refinement in these relationships has been accomplished by Messer who found the relationship

between locus of control and grade point average and test performance to continue to be significant when intelligence was controlled. Contradictions are found in comparing the works of Messer and McGhee and Crandall. The former reported internality for positive events was the greatest predictor of both grade point average and test performance for boys whereas internality for negative events was the greatest predictor for girls; the latter researchers reported the opposite. Finally, Bar-Tal, Kfir, Bar-Zohar, and Chen (1980) and Reid and Croucher (1980) reported these general relationships to exist cross-culturally in Isreal and England respectfully.

Beyond the general reviews cited in the section regarding social learning theory above, the reader may also wish to be aware of the work of Bar-Tal and Bar-Zohar (1977), Crandall et al. (1960), and Stipek and Weisz (1981) who have also reviewed these relationships. For instance, Bar-Tal and Bar-Zohar found 33 out of 36 studies reported similar findings.

Locus of Control and Behaviors Related to Achievement

The relationships between locus of control and a wide variety of behaviors related to achievement have been extensively investigated. This section will review some of these relationships as they have been reported in reference to placement in learning disability programs, class participation, time utilization, persistence,

expectations for success, motivation, cognitive activities, and delayed gratification.

Locus of control and learning disabilities. The placement of a student into a program is not only a reflection of a specific learning disability, but is also an indication of general academic development. It has been from this perspective that several investigators have examined the relationship between locus of control and placement in learning disability programs. A consistent result across these investigations is that students in these programs exhibit lower levels of internality than students in regular programs (Chapman & Boersma, 1979; Fincham & Barling, 1978; Hallahan, Gajar, Cohen, & Tarver, 1978; Hisama, 1976; Snyder, 1982; Torgeson, 1977). Although supportive of this general relationship between level of internality for all events and placement in learning disability programs, Chapman and Boersma (1979) found this relationship was especially true for internality for positive events but was reversed for internality for negative events with students in regular programs being less internal for negative events than were students in learning disability programs.

Locus of control and class participation. Three studies have investigated the relationship between locus of control and student participation in class with mixed results. The first of these studies, by Wolfgang and

Potvin (1973), found that teacher ratings of class participation were related to fifth and sixth grade girls' but not boys' levels of internality. Tesiny, Lefkowitz, and Gordon (1980) also used teachers' ratings of fourth and fifth grade students' work/study habits and found these ratings related to students' levels of internality but did not factor out sex. Finally, Tobin and Capie (1982) found student level of internality to be related to the direct observation of rates of attending and total engagement in middle school science class.

Locus of control and time utilization. Since academic achievement can be hypothesized to be related to how effectively individuals dedicate their time to specific tasks, just as it has been demonstrated to be related to general class participation above, it is important to review the following investigations. The work of Gozali, Cleary, Walster, and Gozali (1973) and Julian and Katz (1968) reported that individuals with higher levels of internality increased the time they spent on tasks as the level of difficulty of the tasks increased. The significance of this finding was further enhanced by their results indicating that those with low levels of internality did not make such changes in their utilization of time.

These results were supported by the works of Lefcourt, Lewis, and Silverman (1968), and Rotter and

Multry (1965) who found that those individuals with higher levels of internality spent more time working on tasks under skill than chance conditions whereas those individuals with lower levels of internality did not.

Locus of control and persistence. Similar to time utilization, an individual's persistence at tasks can be hypothesized to be related to academic achievement. Again, it has been repeatedly demonstrated that those with higher levels of internality also are more persistent in accomplishing instrumental, skilled, or difficult tasks than are those with lower levels of internality (Altshuler & Kassinove, 1975; Barling, 1982; DuCette & Wolk, 1972; Dweck, 1975; Dweck & Reppucci, 1973; Gagne' & Parshall, 1975; Lefcourt & Steffy, 1970; Mischell, Zeiss, & Zeiss, 1974; Rotter & Multry, 1965; Waters, 1972; Wolk & DuCette, 1973). The only exception to these results was reported by Gordon and Bolick (1979) who stated that locus of control was not related to persistence when ability was controlled in their data regarding third grade students working on verbal tasks.

Locus of control and expectations. It has long been recognized that expectations affect rate of academic achievement. As theorized in social learning theory, an individual needs to expect that the probability of a reinforcement is high if that reinforcement is to affect behavior. It is in reference to both of these

considerations that several researchers have investigated the relationship between locus of control and expectations under a wide variety of conditions.

Bar-Tal et al. (1980) found that individuals with higher levels of internality also expressed higher expectations for future success. Comparing expectations under skill versus chance conditions, Battle and Rotter (1963), DuCette and Wolk (1973), Feather (1968), Lefcourt and Ladwig (1966), Phares (1957), and Ryckman, Gold, and Rodda (1971) all reported that individuals with higher levels of internality increased their expectations for future success under skill conditions when successful and decreased their expectations when unsuccessful while individuals with lower levels of internality demonstrated atypical shifts in aspirations by decreasing expectancies after success and increasing after failure.

Locus of control and motivation. Motivation can be best defined within the perspective of social learning theory as a function of both expectation and reinforcement. Within this perspective, an individual's level of motivation is indicated by the levels of energy and satisfaction evidenced by that individual. In this vein, individuals' academic achievement is influenced by their levels of energy and satisfaction related to academic tasks.

Miller (1962) reported that individuals with higher

levels of internality increased their performances when their experience changed from success to failure while individuals with lower levels of internality decreased their performances. In apparent contradiction to Miller's findings, Garrett and Willoughby (1972) found individuals with lower levels of internality performed better than those with higher levels of internality after experiencing failure while those with higher levels of internality performed better than those with lower levels of internality after success. Barling (1982) provided possible resolution of this contradiction in results when he found that the setting of stringent or high standards was related to performance of individuals with lower levels of internality but not to those with higher levels of internality.

Investigating levels of satisfaction, Karabenick (1972) found individuals with higher levels of internality reported greater satisfaction on difficult tasks while those with lower levels of internality reported greater satisfaction on easy tasks. From a motivational perspective, Karabenick's (1972) further finding that individuals with higher levels of internality were more threatened by failure on easy tasks while those with lower levels of internality were more threatened by failure on difficult tasks is important.

Finally, Crandall et al. (1962) and Nowicki and

Strickland (1973) found that students with higher levels of internality also expressed greater desire to do well than students with lower levels of internality.

Locus of control and other cognitive activities. The relationship of locus of control to a wide variety of cognitive activities resulting in learning has been investigated. Although all of these studies will not be reported here, it is important to note that there was a general positive relationship between an individual's level of internality and their intensity of play with intellectual activities during free time (Crandall et al., 1962), level of intentional and unintentional learning (Wolk & DuCette, 1974), attentiveness to those they were interviewing in order to gather information (Lefcourt & Wine, 1969), knowledge about their own condition and the institution in which they lived (Seeman, 1963; Seeman & Evans, 1967), seeking of information by asking questions (Davis & Phares, 1967; Williams & Stack, 1972), and ability/quickness to discover covert intent of experiments (Lefcourt, Gronnerud, & McDonald, 1972).

Locus of control and delayed gratification. Academic achievement is frequently thought to require the ability to delay gratification. This is consistent with social learning theory since the reinforcement value of delayed reinforcement will be decreased for those who cannot cope with such delays. The (in)ability to cope with

delays also affects an individual's expectation for receiving reinforcement that is delayed.

Several studies have consistently demonstrated a positive relationship between an individual's level of internality and ability to respond to delayed gratification. Among these studies are those reported by Erikson and Roberts (1971), Strickland (1972, 1973), Walls and Smith (1970), and Zytkoskee, Strickland, and Watson (1971). These investigations reported similar results across ethnic and socio-economic groupings.

Summary of Locus of Control Research Related to Academic Achievement and Behaviors Related to Achievement

As the reader is now aware, the relationships between locus of control and academic achievement and other behaviors related to achievement have been extensively examined. In general, an individual's level of internality is positively related to academic achievement, class participation, effectiveness of time utilization, persistence, expectations for success, motivation, cognitive activities, and delayed gratification. On the other hand, an individual's level of internality is negatively related to placement in learning disability programs.

Overview of Time as a Research Variable

The relationship between time and academic achievement has been increasingly investigated in recent

years. The reason for this increasing interest appears to be threefold.

The first reason for this interest is because time can be precisely, accurately, and objectively measured. As such, time, more than perhaps any other educational variable, is capable of being measured with reliability and validity.

The second reason for this interest derives from the importance time as a variable has in the theories related to mastery learning. Carroll (1963), Bloom (1971, 1974), and Wiley and Harnischfeger (1974) have included time as a central factor in their theories and formulations. As the desire to maximize students' achievement through the use of mastery learning instructional techniques has increased, so, too, has the interest in time.

The third reason for this interest is due to the nature of time itself. Specifically, time can be controlled, manipulated, and altered relatively easily compared to other educational variables. School districts can affect time through policies, procedures, and contracts. Researchers can affect time as a variable.

Theories Regarding Time and Achievement

The first major theory focusing on the relationship between time and academic achievement was Carroll's (1963) model of school learning. He suggested that there are five factors which influence the amount of time a

student needs in order to learn any specific content. These factors are:

1) Aptitude--the amount of time an idividual needs to learn a given task under optimal instructional conditions.
2) Ability--to understand instruction.
3) Perseverance--the amount of time the individual is willing to actively engage in learning.
4) Opportunity to learn--the time allowed for learning.
5) Quality of instruction--the degree to which instruction is presented so as not to require additional time for mastery beyond that required by the aptitude of the learner.

Carroll described the inter-relationships between these five variables through the following formula:

$$\text{Degree of Learning} = f\left[\frac{\text{time actually spent}}{\text{time needed}}\right]$$

In his discussion, Carroll pointed to the difference between opportunity to learn and engaged time. Opportunity to learn is the time allocated by the teacher to learning a given concept. Engaged time is the time during which a student is actively involved in learning activities related to the concept. Carroll further pointed out that a major difference between the high- and low-achievers lay in their level of perseverance with

the high-achieving students mastering more material due to their greater ability to actively engage in learning activities.

Bloom's (1971, 1974) model of school learning discussed three major factors influencing achievement; cognitive entry behaviors, affective entry characteristics, and quality of instruction. Bloom emphasized the importance of student motivation and active participation, respectively, to students' achievement.

Wiley and Harnischfeger (1974) suggested that student achievement is primarily determined by only two variables: the total time needed to learn a task and the total time actually spent on the task. Although their focus was on teacher behaviors which influence the amount of time students actually spend on tasks, they also referred to individual pupil characteristics and especially to motivation.

Definitions of Time and the Relationship Between Time and Achievement

The basic unit in which time has been measured has been defined in a wide variety of ways. It is important that the reader be aware of these varying definitions in order to understand the relationships being discussed between time and achievement and to understand the relationship between one study and the rest. Reflective of the professional literature, this paper will focus on school year, attendance year, school day, instructional

day, allocated time, engaged time, and academic learning time.

School year. School year is defined as the number of days students are scheduled to be enrolled in school during one academic year or grade. Anton reported the school year averaged about 179 days nation-wide in 1981. Wiley and Harnischfeger (1974) indicated there existed a range of about 10 days between the shortest and longest state-wide average school years. After reviewing several investigations evaluating the relationship between the length of the school year and student achievement, Fredrick and Walberg (1980) concluded that the coefficients in these investigations varied widely. Discussing the lack of significant and consistent findings, Karweit (1976) suggested that the relationship between achievement and length of school year might not be linear since other variables, for example, absenteeism, might come into play. Certainly, the limited variability in school years, nature, and amount of instructional content covered, length of school days, and time allocated to different subjects would also have effects on this relationship.

Attendance year. Because of illness, vacation, or simply skipping school, students do not always attend school every day of the school year. Attendance year is defined as the actual number of days students

participate in school during a school year. Kremmer (cited in Caldwell, Huitt, & Graeber, 1982) found that each student enrolled nation-wide in 1974 attended an average of about 160 days of school thereby reducing the school year approximately 11 percent. Brady, Clinton, Sweeney, Peterson, and Poyner (1977) studied students in Title (Chapter) I classes for remedial students and found they were absent an average of 45 days or approximately 25 percent of the school year. Investigations by Bond and Dykstra (1967); Harris, Morrison, Serwer, and Gold (1968); and Kear, Summers, Raivetz, and Farber (cited in Caldwell et al., 1982) all substantiate the inverse relationship between absenteeism and student achievement.

School day. School day is defined as the number of hours each day that students are in school. As such, school day includes time that is spent in instruction plus time that is spent in recess and lunch activities. This writer is unaware of any studies either describing the length of the school day or its relationship to student achievement.

Instructional day. Instructional day or instructional time is that portion of the school day that is spent on instruction. As such, the time involved in recess and lunch activities in the school day is excluded. Unclear in many studies is whether or not

general management activities such as roll call, taking lunch count and monies, and giving general directions for the day are included as part of the instructional day. Because of this lack of clarity, the time accounted as the instructional day and its relationship to student achievement lacks consistent reliability from one study to another. Nevertheless, Brady et al. (1977) and Passow, Noah, Eckstein, and Mallea (1976) reported that the average length of the instructional day is approximately five hours. Investigating the variability in the instructional day within a single district, Markwell (1983), and Wiley and Harnischfeger (1974) found differences of one and two hours respectively. Harris et al. (1968) found students' reading achievement in first and second grades to be positively related to length of school day. Gilbert and Price (1981) reported that extended-day programs improved achievement in all grades.

Allocated time. Allocated time is that portion of the instructional day that is dedicated to instruction in specific subjects. As with the term instructional day, there is some lack of clarity in the use of allocated time by different researchers. For some researchers, allocated time equates to scheduled time whereas for other researchers allocated time refers to actual time spent. The difference between these two uses is that

the former also includes interruptions due to spontaneous, unplanned events such as assemblies, emergency drills, announcements, and so forth, whereas the latter do not.

Given the limitations inherent in the different uses of the term allocated time, the professional literature does provide some information. Dishaw (1977b), Graeber, Rim and Unks (cited in Caldwell et al., 1982), Holmes (1915), Mann (1928), Payne (1905), and Rosenshine (1980) reported that the average number of minutes per day in reading and language arts ranged from 85 to 133 minutes. These authors disagreed on the point of differences between grade levels. Graeber et al., (cited in Caldwell et al., 1982), Holmes (1915), Mann (1928), and Payne (1905) reported decreasing allotments in the the elementary grades whereas Dishaw (1977b) and Rosenshine (1980) reported the reverse. These same authors reported that the average number of minutes per day in mathematics ranged from 33 to 55 minutes. Parallel to above, these authors also disagreed whether or not the allocation increased as grade levels increased.

Comparing differences between classrooms at the same grade, Dishaw (1977b) and Rosenshine (1980) reported second grade ranged from a low of 24 minutes to a high of 61 minutes in math and a low of 32 minutes to a high of 131 minutes in reading. These authors reported fifth grade ranged from a low of 18 minutes to a high of 80 minutes in reading. In a similar manner, Dishaw (1977a)

also compared students within one class and found a range of 39 to 75 minutes in math.

Relating allocated time as scheduled to achievement in basic skills, Cooley and Leinhardt (cited in Caldwell et al., 1982) found no correlation. On the other hand, Borg (1980) and Fisher et al. (1978) found positive relationships between time actually allocated (subtracting the time spent in interruptions, emergencies, etc., from scheduled time) and student achievement in second grade reading comprehension, word structure and fractions and fifth grade fractions and total math. Lambert and Hartsough (1976) found that the effect of allocated time on student achievement was strongly influenced by the size of the instructional group and the type of supervision received by the students.

Engaged time. Engaged time is defined as the time a student is actively attending to and engaged in instruction. Engaged time is also referred to as time-on-task. Because of distractions, students are not engaged in instructional activities throughout the time allocated for instruction. As such, engaged time represents a refinement over allocated time.

Guthrie (1982) referred to the work of Leinhardt, Zigmond, and Cooley when he pointed out that some students attended as much as 23 percent of the day while other students attended 9 percent during silent reading

activities. Relating attention to reading achievement, Guthrie further reported that an increase of five minutes per day in silent reading would result in a one month gain in performance on norm-referenced tests. Gettinger and White (1979) and Lahaderne (1968) found student engagement was a stronger predictor of achievement than performance on intelligence tests. Meyers, Attwell, and Orpet (1968) found teacher ratings of attention in kindergarten to be the most strongly related correlate to academic achievement in fifth grade than any other behavioral rating or than 13 ability tests. Anderson (1975), Fisher et al. (1978), and Rim and Coller (cited in Caldwell et al., 1982) reported that observed engaged time was positively related to reading and math achievement. In their reviews, Rosenshine (1979) found 13 out of 14 studies and Stuck (cited in Wyne & Stuck, 1982) found 22 out of 23 studies reporting higher achievement with greater engagement. Bloom (1974) indicated as much as 60 percent of the variation in student achievement was accounted for by individual variation in engagement.

Academic learning time. Academic learning time is a measure that was introduced in Phase III of the Beginning Teacher Evaluation Study and reported by Fisher et al. (1978). Academic learning time is defined as that portion of engaged time during which students are experiencing

relatively high degrees of learning success. Data from Fisher et al. (1978) strongly supports the very positive relationship between academic learning time and performance on achievement tests.

Summary of Time as It Relates to Academic Achievement

In summary, time has become increasingly important as a research variable in investigating academic achievement. This importance has been due to its ability to be measured with reliability and validity; to the theories of Bloom (1971, 1974), Carroll (1963), and Wiley and Harnischfeger (1974), and to the almost consistent positive relationship it demonstrates with achievement. As has been indicated, the strength and consistency of this relationship is enhanced with each refinement from school year to academic learning time.

Chapter 3

Research Methodology

This study focuses on the relationships between locus of control and academic learning time. In the most general form, the null hypothesis is that there is no relationship between locus of control (for all, positive, and negative events) and the rate of academically engaged learning time (for mathematics and language arts separately and together).

The investigation is both descriptive and correlational in nature. A sample of students in regular, fourth grade classes was administered the Intellectual Achievement Responsibility Scale (Crandall et al., 1965). These students were then observed to determine their rate of academically engaged learning time. The results of these administrations and observations were then collectively analyzed utilizing statistical procedures of means, standard deviations, partial and full correlations, and analyses of variance.

Sample

The sample of students for this study consisted of one-half of the total fourth grade student body in two year-around schools in Watsonville, California. Because it was important to insure stability in the

population and procedures in the classrooms and because year-around schools have staggered vacation and instructional times, only two of the four calendar tracks were acceptable for this study. Both of these tracks had been advanced from the third to the fourth grade at the start of July and neither track was scheduled to have vacation until September. This allowed the test administrations and student observations to occur undisturbed from the fourth week of July through the second week of August.

One of the schools (School "A") organized its grades and instruction according to single grade levels of self-contained classrooms. The other school (School "B") organized its grades and instruction by having combined grade levels (one class was a third-fourth combination and the other was a fourth-fifth combination) and by departmentalizing instruction (students changed classrooms and teachers for reading, mathematics, and a combination of other subjects, e.g., physical education, social studies, and science, having two periods each day in each of these three areas). Table 3.1 provides information regarding the number of students in each of these schools.

Table 3.1

Sample of Students According to School

School	n	% of sample
A	34	60.7
B	22	39.3
Total	56	100.0

Following the collection of data, analyses of variance were computed in order to determine if there were significant differences between the two schools and any of the major variables of the study. Table 3.2 reports that there were significant differences in the following variables: reading and math skills as measured by the Comprehensive Test of Basic Skills, rate of engagement during self-directed math activities, rate of engagement during self- and other-directed reading activities, and rate of engagement for a composite of reading and math self- and other-directed activities. To control for these significant differences, the reader will note in chapter 4 that grade organization is included in many of the partial correlations even though it was not originally hypothesized to be a major variable in the relationships under study.

Table 3.2

Analyses of Variance Between School Structure and Hypothesized Variables

Variable	F ratio	Level of significance	School with highest mean
Reading achievement	0.41	.41	
Math achievement	4.06	.05	A
LOC positive events	0.19	.67	
LOC negative events	0.03	.86	
LOC all events	0.19	.67	
Math engagement other-directed	1.69	.20	
Math engagement self-directed	68.22	.00	A
Reading engagement other-directed	17.50	.00	A
Reading engagement self-directed	8.40	.01	A
Composite engagement other-directed	4.11	.05	A
Composite engagement self-directed	43.62	.00	A

Further information about the sample is contained in the remaining tables in this chapter. Each table is incorporated in the section describing how the data were gathered.

The Instruments

This investigation utilized data gathered from student completed tests and investigator observations. As described below, the data so accumulated were considered to be of sufficient validity and reliability to warrant their use in such a research project.

Student completed tests. Data were generated from student responses to two tests. These tests were the Intellectual Achievement Responsibility Scale (IARS) and the Comprehensive Test of Basic Skills (CTBS).

The Intellectual Achievement Responsibility Scale (IARS) was developed by Crandall et al. (1965) (see Appendix A). The IARS consists of two interwoven subtests: one measuring locus of control for positive events and one measuring locus of control for negative events. These two subtests produce separate results that can also be combined to produce an indication of locus of control for all events. The IARS exhibits the following test-retest reliabilities: total (for all events) level of internality--.69; level of internality for positive events--.66; and level of internality for negative events--.75. Although the IARS's basic validity is content validity, further construct validity is shown

in its correlations to age, grade, sex, social class, ordinal position, family size, social desirability, and prediction of standardized achievement test performance (Crandall et al., 1965). Its validity is further demonstrated by its extensive use in research projects of this type.

The Comprehensive Tests of Basic Skills (CTBS) has a standard error of measurement of the following in each of the areas used: total reading--3.98, total mathematics-4.15 (Comprehensive Tests of Basic Skills-Technical Bulletin No. 1, 1974; Comprehensive Tests of Basic Skills--Technical Bulletin No. 2, 1974). Its validity is supported by its high correlations to other standard measures of academic achievement and by its wide use throughout the United States.

Investigator observation. Individual student rates of academically engaged learning time were assessed by direct observation according to the rating scale developed by Marliave, Fisher, Filby, and Dishaw (1977) and used in the Beginning Teacher Evaluation Study (see Appendix B). The two observers received training in the use of this rating scale from the Far West Laboratory for Educational Research and Development. The laboratory obtained an interobserver reliability coefficient between a low of .82 (for observing students in second grade) and a high of .91 (for observing students in fifth grade). As indicated in Table 3.3 the interobserver reliability coefficient in the present study was significant beyond the .001 level

in all ratings and ranged from a low of .48 to a high of .95. The rating scale's validity is indicated by its descriptions of the behaviors to be observed.

Table 3.3

Interobserver Reliability for Academically Engaged Learning Time

Activity	Language arts		Math	
	Correlation coefficient	Level of significance	Correlation coefficient	Level of significance
Engaged during self-directed activities	.86	<.01	.89	<.01
Not engaged during self-directed activities	.81	<.01	.92	<.01
Engaged during other-directed activities	.82	<.01	.95	<.01
Not engaged during other-directed activities	.79	<.01	.48	<.01

Data Gathering

The data were gathered through three means: a review of students' records as contained in their cumulative files, administration of the Intellectual Achievement Responsibility Scale, and the direct observation of classroom behaviors.

Review of student files. Student files were reviewed in order to determine sex, ethnicity, qualification for free or reduced lunch, and performance on the Comprehensive Test of Basic Skills. Tables 3.4, 3.5, 3.6, and 3.7 provide the results of this review.

Table 3.4

Sample of Students Classified According to Sex

Sex	n	% of sample
Male	33	58.9
Female	22	39.3
Unknown	1	1.8
Total	56	100.0

Table 3.5

Sample of Students Classified According to Qualifications for Free Lunch

Qualification	n	% of sample
Free	18	32.1
Reduced-cost	11	19.6
Full-cost	22	39.3
Unknown	5	8.9
Total	56	99.9

Table 3.6

Sample of Students Classified According to Ethnicity

Ethnicity	n	% of sample
Hispanic	34	60.7
Caucasian	10	17.9
Unknown	12	21.4
Total	56	100.0

Table 3.7

Sample of Students Classified According to Performance on Comprehensive Test of Basic Skills

Percentile ranges	Total reading	Total math
0-9	6	5
10-19	4	3
20-29	3	1
30-39	5	4
40-49	5	1
50-59	5	3
60-69	5	6
70-79	4	7
80-89	2	7
90-99	3	5
Unknown	14	14
	N = 56	N = 56
	$\underline{M}$ = 46.0	$\underline{M}$ = 59.4
	$\underline{SD}$ = 27.1	$\underline{SD}$ = 29.9

Administration of the Intellectual Achievement Responsibility Scale. The Intellectual Achievement Responsibility Scale (IARS) was group administered to the students by this researcher. Because Gorsuch, Henighan and Barnard (1972) found that students' responses were significantly correlated to their verbal skills and abilities, the IARS was read to the total class while the students had the complete protocol in front of them for their own perusal. No other help was provided. In order to insure that these results did not bias observations of classroom behavior, the IARS protocols were not scored until after all observations were completed. Appendix A indicates the scoring of the IARS with credit being given for internal responses. The results of this scoring is demonstrated in Table 3.8. Comparison of these results with those of Crandall et al. (1965) indicates no significant differences are apparent between the sample used in this study and theirs.

Table 3.8

Locus of Control for Positive, Negative, and All Events

Locus of control	N	M	SD
For positive events	56	12.80	2.32
For negative events	56	9.88	3.51
For all events	56	22.64	4.50

Observation of classroom behaviors. Following the recommendations of Cooley and Mao (1981) and Karweit and Slavin (1982), students were observed one day each week for three weeks. These observations were conducted during the total time of the students' language arts and mathematics instruction. In order to eliminate bias and to increase the validity of the observational characteristics and results as much as possible, the observations were completed by two trained observers who were uninformed regarding each others' observational ratings or any other student characteristics. The student behaviors were individually rated according to the rating scale used by the Beginning Teacher Evaluation Study described above and contained in Appendix B. Observations and ratings were taken on a time-based (once every two minutes), rotating sample procedure. Table 4.0 presents the means and standard deviations resulting from these observations.

Table 3.9

Academically Engaged Learning Time

Activity	M	SD
Language Arts		
Engaged during self-directed activities	58.9	17.6
Engaged during other-directed activities	74.0	21.3
Math		
Engaged during self-directed activities	58.3	21.6
Engaged during other-directed activities	49.4	36.2
Combined Language Arts and Math		
Engaged during self-directed activites	58.6	16.9
Engaged during other-directed activities	61.7	19.4

Hypotheses

This investigation attempts to answer the following general question:

> What is the relationship between locus of control (for all, positive, and negative events) and rate of academically engaged learning time (for mathematics and language arts separately and together) and how is this relationship affected by the sex, ethnicity socio-economic status, and achievement of the student?

Because of the significant differences between the two

schools, this general hypothesis was also analyzed in terms of school organization.

Operationally, this general question was divided into the following specific hypotheses and their corollaries.

Hypothesis 1. There is no relationship between locus of control for all events and combined rate of academically engaged learning time for mathematics and language arts instruction. Corollaries 1 through 5 of this hypothesis investigated the effects sex, ethnicity, school organization, socio-economic status, and achievement of the student have upon the relationship. The analysis of the data involved computing a Pearson Product-Moment correlation between the variables referred to in the hypothesis and computing partial correlations among the main and controlling variables.

Hypothesis 2. There is no relationship between locus of control for positive events and combined rate of academically engaged learning time for mathematics and language arts instruction. Corollaries 1 through 5 of this hypothesis investigated the effects of the same control variables referred to in Hypothesis 1. The analysis of the data was the same as that used for Hypothesis 1.

Hypothesis 3. There is no relationship between locus of control for negative events and combined rate of academically engaged learning time for mathematics

and language arts instruction. Corollaries 1 through 5 of this hypothesis investigated the effects of the same control variables referred to in Hypothesis 1. The analysis of the data was the same as that used for Hypothesis 1.

Hypothesis 4. There is no relationship between locus of control for all events and rate of academically engaged learning time for mathematics instruction. Corollaries 1 through 5 of the hypothesis investigated the effects of the same control variables referred to in Hypothesis 1. The analysis of the data was the same as that used for Hypothesis 1.

Hypothesis 5. There is no relationship between locus of control for positive events and rate of academically engaged learning time for mathematics instruction. Corollaries 1 through 5 of this hypothesis investigated the effects of the same control variables referred to in Hypothesis 1. The analysis of the data was the same as that used for Hypothesis 1.

Hypothesis 6. There is no relationship between locus of control for negative events and rate of academically engaged learning time for mathematics instruction. Corollaries 1 through 5 of this hypothesis investigated the effects of the same control variables referred to in Hypothesis 1. The analysis of the data was the same as that used for Hypothesis 1.

Hypothesis 7. There is no relationship between locus of control for all events and rate of academically engaged learning time for language arts instruction. Corollaries 1 through 5 of this hypothesis investigated the effects of the same control variables referred to in Hypothesis 1. The analysis of the data was the same as that used for Hypothesis 1.

Hypothesis 8. There is no relationship between locus of control for positive events and rate of academically engaged learning time for language arts instruction. Corollaries 1 through 5 of this hypothesis investigated the effects of the same control variables referred to in Hypothesis 1. The analysis of the data was the same as that for Hypothesis 1.

Hypothesis 9. There is no relationship between locus of control for negative events and rate of academically engaged learning time for language arts instruction. Corollaries 1 through 5 of this hypothesis investigated the effects of the same control variables referred to in Hypothesis 1. The analysis of the data was the same as that for Hypothesis 1.

Data Analysis

Data analysis for all of the nine hypotheses were the same. Because the variables are either dichotomous (e.g., sex, ethnicity, and school organization) or continuous (e.g., locus of control rate of academically

engaged learning time, socio-economic status, and achievement), parametric procedures were appropriate (Shu & Feldt, 1969).

Pearson Product-Moment correlations were used to test the relationships between the main variables (e.g., locus of control and rate of academically engaged learning time) stated in the various hypotheses. Partial correlations were used to test the relationships between the main variables while statistically controlling the secondary variables (e.g., sex, ethnicity, school organization, socio-economic status, and achievement). Both the Pearson Product-Moment correlations and partial correlations were computed using the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975).

Although the general population of all fourth grade students is finite, the statistical procedures used in this investigation assumed an infinite population. This was appropriate due to the very large size of the general population, the fraction of elements sampled, and because any error so introduced was such as to reduce the level of significance thereby making any resulting conclusions more conservative (Hopkins & Glass, 1978).

Finally, alpha was set at the .10 level. This was done in order to balance the desire not to prematurely reject important findings in a preliminary study such as this because of possible poor sensitivity of the

instruments with the need to restrict error due to the relatively small sample size.

Chapter 4

Data Analysis and Discussion

This chapter presents the analysis of the data gathered in this study and a discussion of their implications. For clarity, the section regarding analysis preceeds and is separate from the discussion section.

Data Analysis

The report of the analysis of the data is organized according to the hypotheses and corollaries stated in chapter 3. Each hypothesis and related corollaries is first restated and then followed by pertinent comments and tables.

Hypothesis 1. Hypothesis 1 stated, "There is no relationship between locus of control for all events and combined rate of academically engaged learning time for mathematics and language arts instruction." Table 4.1 reports the Pearson Product-Moment correlation coefficients and levels of significance between the variables referred to in this hypothesis. No significant relationship was found at the .10 level.

Table 4.1

Relationship Between Locus of Control for All Events and Combined Rate of Academically Engaged Learning Time for Mathematics and Language Arts Instruction

Math and language arts instruction	Correlation coefficient	Level of significance	n
Self-directed	-.03	.41	56
Other-directed	-.10	.28	39

Corollaries 1 through 5 focused on the effects sex, ethnicity, school organization, socio-economic status, and achievement of the student have upon the relationship between locus of control for all events and combined rate of academically engaged learning time for mathematics and language arts instruction. Table 4.2 reports the partial correlation coefficients and levels of significance between these latter main variables referred to in the hypothesis when the secondary variables referred to in the corollaries are statistically held constant. Similarly to the general hypothesis, no significant relationship was found at the .10 level.

Table 4.2

Relationship Between Locus of Control for All Events and Combined Rate of Academically Engaged Learning Time for Mathematics and Language Arts Instruction Controlling for Sex, Ethnicity, School Organization, Socio-Economic Status, and Achievement

Control Variable	Self-directed		Other-directed		n
	Partial correlation coefficient	Level of significance	Partial correlation coefficient	Level of significance	
Sex	-.06	.35	-.09	.30	36
Ethnicity	-.16	.20	-.22	.12	29
School organization	.04	.40	-.07	.34	36
Socio-economic status	-.09	.30	-.14	.21	35
Reading achievement	-.05	.40	-.06	.38	28
Math achievement	-.03	.45	-.06	.37	27

Hypothesis 2. Hypothesis 2 stated, "There is no relationship between locus of control for positive events and combined rate of academically engaged learning time for mathematics and language arts instruction. Table 4.3 presents the correlation coefficients and levels of significance between the variables referred to in this hypothesis. No significant relationship was found at the .10 level.

Table 4.3

Relationship Between Locus of Control for Positive Events and Combined Rate of Academically Engaged Learning Time for Mathematics and Language Arts Instruction

Math and language arts instruction	Correlation coefficient	Level of Significance	n
Self-directed	.07	.32	56
Other-directed	-.07	.35	39

Corollaries 1 through 5 focused on the effects sex, ethnicity, school organization, socio-economic status, and achievement of the student have upon the relationship between locus of control for positive events and combined rate of academically engaged learning time for mathematics and language arts instruction. Table 4.4 presents the partial correlation coefficients and levels of significance between these latter main variables referred to in the

hypothesis when the secondary variables referred to in the corollaries are statistically held constant. No significant relationship was found at the .10 level.

Table 4.4

Relationship Between Locus of Control for Positive Events and Combined Rate of Academically Engaged Learning Time for Mathematics and Language Arts Instruction Controlling for Sex, Ethnicity, School Organization, Socio-Economic Status, and Achievement

Control variable	Self-directed		Other-directed		n
	Partial correlation coefficient	Level of significance	Partial correlation coefficient	Level of significance	
Sex	.03	.42	-.03	.42	36
Ethnicity	.11	.28	-.07	.35	29
School organization	.20	.11	-.04	.41	36
Socio-economic status	.03	.43	-.10	.27	35
Reading achievement	.19	.16	-.01	.48	28
Math achievement	.17	.18	-.02	.46	27

Hypothesis 3. Hypothesis 3 stated, "There is no relationship between locus of control for negative events and combined rate of academically engaged learning time for mathematics and language arts instruction." Table 4.5 presents the correlation coefficients and levels of significance between the variables referred to in this hypothesis. No significant relationship was found at the .10 level.

Table 4.5

Relationship Between Locus of Control for Negative Events and Combined Rate of Academically Engaged Learning Time for Mathematics and Language Arts Instruction

Math and language arts instruction	Correlation coefficient	Level of significance	n
Self-directed	-.09	.26	56
Other-directed	-.07	.35	39

Corollaries 1 through 5 focused on the effects sex, ethnicity, school organization, socio-economic status, and achievement of the student have upon the relationship between locus of control for negative events and combined rate of academically engaged learning time for mathematics and language arts instruction. Table 4.6 presents the partial correlation coefficients and levels of significance between these latter main variables referred to in the

hypothesis when the secondary variables referred to in the corollaries are statistically held constant. Only one relationship appears significant at the .10 level. This relationship indicates that when ethnicity is controlled (e.g., the relationship is being studied within single ethnic groupings), higher levels of internality for negative events tend to be related to lower combined rates of academically engaged learning time for mathematics and language arts self-directed instruction.

Table 4.6

Relationship Between Locus of Control for Negative Events and Combined Rate of Academically Engaged Learning Time for Mathematics and Language Arts Instruction Controlling for Sex, Ethnicity, School Organization, Socio-Economic Status, and Achievement

Control Variable	Self directed		Other-directed		n
	Partial correlation coefficient	Level of significance	Parital correlation coefficient	Level of significance	
Sex	-.10	.27	-.07	.33	36
Ethnicity	-.27	.07	-.19	.15	29
School organization	-.07	.35	-.04	.40	36
Socio-economic status	-.12	.23	-.08	.31	35
Reading achievement	-.19	.16	-.05	.40	28
Math achievement	-.15	.22	-.05	.39	27

Hypothesis 4. Hypothesis 4 stated, "There is no relationship between locus of control for all events and rate of academically engaged learning time for mathematics instruction." Table 4.7 presents the correlation coefficients and levels of significance between the variables referred to in this hypothesis. No significant relationship was found at the .10 level.

Table 4.7

Relationship Between Locus of Control for All Events and Rate of Academically Engaged Learning Time for Mathematics Instruction

Mathematics instruction	Correlation coefficient	Level of significance	n
Self-directed	.05	.35	56
Other-directed	-.04	.40	39

Corollaries 1 through 5 focused on the effects sex, ethnicity, school organization, socio-economic status, and achievement of the student have upon the relationship between locus of control for all events and rate of academically engaged learning time for mathematics. Table 4.8 presents the partial correlation coefficients and levels of significance between these latter main variables referred to in the hypothesis when the secondary variables referred to in the corollaries are statistically held constant. No significant relationship was found at the .10 level.

Table 4.8

Relationship Between Locus of Control for All Events and Rate of Academically Engaged Learning Time for Mathematics Instruction Controlling for Sex, Ethnicity, School Organization, Socio-Economic Status, and Achievement

Control Variable	Self-directed		Other-directed		n
	Partial correlation coefficient	Level of significance	Partial correlation coefficient	Level of significance	
Sex	-.05	.39	-.02	.44	36
Ethnicity	-.16	.20	-.19	.16	29
School organization	.07	.34	-.02	.45	36
Socio-economic status	-.07	.34	-.06	.36	35
Reading achievement	.01	.49	-.04	.41	28
Math achievement	.02	.46	-.06	.39	27

Hypothesis 5. Hypothesis 5 stated, "There is no relationship between locus of control for positive events and rate of academically engaged learning time for mathematics instruction." Table 4.9 presents the correlation coefficients and levels of significance between the variables referred to in this hypothesis. No significant relationship was found at the .10 level.

Table 4.9

Relationship Between Locus of Control for Positive Events and Rate of Academically Engaged Learning Time for Mathematics Instruction

Mathematics instruction	Correlation coefficient	Level of significance	n
Self-directed	.14	.15	56
Other-directed	-.10	.27	39

Corollaries 1 through 5 focused on the effects sex, ethnicity, school organization, socio-economic status, and achievement of the student have upon the relationship between locus of control for positive events and rate of academically engaged learning time for mathematics. Table 4.10 presents the partial correlation coefficients and levels of significance between these latter main variables referred to in the hypothesis when the secondary variables referred to in the corollaries are statistically held constant. Only one relationship

appears significant at the .10 level. This relationship indicates that when school organization is controlled (e.g., the relationship is being studied within the context of either single versus multi-graded or self-contained versus departmentalized school structures), higher levels of internality for positive events tend to be related to higher rates of academically engaged learning time for mathematics self-directed instruction.

Table 4.10

Relationship Between Locus of Control for Positive Events and Rate of Academically Engaged Learning Time for Mathematics Instruction Controlling for Sex, Ethnicity, School Organization, Socio-Economic Status, and Achievement

Control variable	Self-directed		Other-directed		n
	Partial correlation coefficient	Level of significance	Partial correlation coefficient	Level of significance	
Sex	.05	.39	-.06	.37	36
Ethnicity	.07	.35	-.13	.25	29
School organization	.22	.09	-.08	.31	36
Socio-economic status	.04	.41	-.12	.24	35
Reading achievement	.16	.20	-.10	.31	28
Math achievement	.13	.24	-.10	.31	27

Hypothesis 6. Hypothesis 6 stated, "There is no relationship between locus of control for negative events and rate of academically engaged learning time for mathematics instruction." Table 4.11 presents the correlation coefficients and levels of significance between the variables referred to in this hypothesis. No significant relationship was found at the .10 level.

Table 4.11

Relationship Between Locus of Control for Negative Events and Rate of Academically Engaged Learning Time for Mathematics Instruction

Mathematics instruction	Correlation coefficient	Level of significance	n
Self-directed	-.03	.41	59
Other-directed	.03	.42	39

Corollaries 1 through 5 focused on the effects sex, ethnicity, school organization, socio-economic status, and achievement of the student have upon the relationship between locus of control for negative events and rate of academically engaged learning time for mathematics. Table 4.12 presents the partial correlation coefficients and levels of significance between these latter main variables referred to in the hypothesis when the secondary variables referred to in the corollaries are statistically held

constant. Only one relationship appears significant at the .10 level. This relationship indicates that when ethnicity is controlled (e.g., the relationship is being studied within single ethnic groupings), higher levels of internality for negative events tend to be related to lower rates of academically engaged learning time for mathematics self-directed instruction.

Table 4.12

Relationship Between Locus of Control for Negative Events and Rate of Academically Engaged Learning Time for Mathematics Instruction Controlling for Sex, Ethnicity, School Organization, Socio-Economic Status, and Achievement

Control variable	Self-directed		Other-directed		n
	Partial correlation coefficient	Level of significance	Partial correlation coefficient	Level of significance	
Sex	-.09	.30	.03	.44	36
Ethnicity	-.24	.09	-.12	.26	29
School organization	-.04	.40	.05	.38	36
Socio-economic status	-.11	.26	.02	.44	35
Reading achievement	-.11	.29	.04	.42	28
Math achievement	-.07	.36	.02	.46	27

Hypothesis 7. Hypothesis 7 stated, "There is no relationship between locus of control for all events and rate of academically engaged learning time for language arts instruction." Table 4.13 presents the correlation coefficients and levels of significance between the variables referred to in this hypothesis. No significant relationship was found at the .10 level.

Table 4.13

Relationship Between Locus of Control for All Events and Rate of Academically Engaged Learning Time for Language Arts Instruction

Language arts instruction	Correlation coefficient	Level of significance	n
Self-directed	-.13	.18	56
Other-directed	.03	.42	55

Corollaries 1 through 5 focused on the effects sex, ethnicity, school organization, socio-economic status, and achievement of the student have upon the relationship between locus of control for all events and rate of academically engaged learning time for mathematics. Table 4.14 presents the partial correlation coefficients and levels of significance between these latter variables referred to in the hypothesis when the secondary variables referred to in the corollaries are statistically held constant. No significant relationship was found at the .10 level.

Table 4.14

Relationship Between Locus of Control for All Events and Rate of Academically Engaged Learning Time for Language Arts Instruction Controlling for Sex, Ethnicity, School Organization, Socio-Economic Status, and Achievement

Control variable	Self-directed		Other-directed		n
	Partial correlation coefficient	Level of significance	Partial correlation coefficient	Level of significance	
Sex	-.07	.33	-.13	.21	36
Ethnicity	-.12	.26	-.19	.16	29
School organization	.00	.50	-.10	.27	36
Socio-economic status	-.09	.30	-.18	.14	35
Reading achievement	-.10	.30	-.06	.38	28
Math achievement	-.08	.35	-.06	.38	27

Hypothesis 8. Hypothesis 8 stated, "There is no relationship between locus of control for positive events and rate of academically engaged learning time for language arts instruction." Table 4.15 presents the correlation coefficients and levels of significance between the variables referred to in this hypothesis. No significant relationship was found at the .10 level.

Table 4.15

Relationship Between Locus of Control for Positive Events and Rate of Academically Engaged Learning Time for Language Arts Instruction

Language arts instruction	Correlation coefficient	Level of significance	n
Self-directed	-.05	.36	56
Other-directed	.11	.21	55

Corollaries 1 through 5 focused on the effects sex, ethnicity, school organization, socio-economic status, and achievement of the student have upon the relationship between locus of control for positive events and rate of academically engaged learning time for language arts. Table 4.16 presents the partial correlation coefficients and levels of significance between these latter variables referred to in the hypothesis when the secondary variables referred to in the corollaries are statistically held constant. No significant relationship was found at the .10 level.

Table 4.16

Relationship Between Locus of Control for Positive Events and Rate of Academically Engaged Learning Time for Language Arts Instruction Controlling for Sex, Ethnicity, School Organization, Socio-Economic Status, and Achievement

Control variable	Self-directed		Other-directed		n
	Partial correlation coefficient	Level of significance	Partial correlation coefficient	Level of significance	
Sex	.01	.48	-.00	.49	36
Ethnicity	.13	.24	.00	.49	29
School organization	.11	.25	.03	.44	36
Socio-economic status	.01	.48	-.05	.38	35
Reading achievement	.19	.15	.09	.33	28
Math achievement	.19	.16	.07	.36	27

Hypothesis 9. Hypothesis 9 stated, "There is no relationship between locus of control for negative events and rate of academically engaged learning time for language arts instruction." Table 4.17 presents the correlation coefficients and levels of significance between the variables referred to in this hypothesis. No significant relationship was found at the .10 level.

Table 4.17

Relationship Between Locus of Control for Negative Events and Rate of Academically Engaged Learning Time for Language Arts Instruction

Language arts instruction	Correlation coefficient	Level of significance	n
Self-directed	-.13	.16	56
Other-directed	-.04	.40	55

Corollaries 1 through 5 focused on the effects sex, ethnicity, school organization, socio-economic status, and achievement of the student have upon the relationship between locus of control for negative events and rate of academically engaged learning time for language arts instruction. Table 4.18 presents the partial correlation coefficients and levels of significance between the latter variables referred to in the hypothesis when the secondary variables referred to in the corollaries are statistically held constant. Only two relationships appear significant

at the .10 level. Both of these relationships indicate that higher levels of internality for negative events tend to be related to lower rates of academically engaged learning time for language arts self-directed instruction when either ethnicity of reading achievement is controlled (e.g., the relationship is being studied within single ethnic groupings or levels of reading achievement).

Table 4.18

Relationship Between Locus of Control for Negative Events and Rate of Academically Engaged Learning Time for Language Arts Instruction Controlling for Sex, Ethnicity, School Organization, Socio-Economic Status, and Achievement

Control variable	Self-directed		Other-directed		n
	Partial correlation coefficient	Level of significance	Partial correlation coefficient	Level of significance	
Sex	-.10	.28	-.16	.17	36
Ethnicity	-.24	.10	-.23	.11	29
School organization	-.06	.35	-.14	.20	36
Socio-economic status	-.11	.25	-.18	.14	35
Reading achievement	-.26	.08	-.13	.24	28
Math achievement	-.22	.12	-.12	.27	27

Discussion

The discussion is divided into two sections. The first of these sections focuses on the significance of the data gathered and analyzed in this investigation. The second section relates these findings to those reported in the review of the literature.

Present data. As reported in the previous narrative and tables in this chapter, very few relationships were found to be statistically significant at the .10 level. In fact, no such relationships were discovered through computing correlation coefficients. The five relationships that were found to be significant at the .10 level were discovered by utilizing the more specific statistical tests involved in computing partial correlation coefficients.

Of the five relationships found to be statistically significant, three required holding constant students' ethnicity, one required holding constant students' reading achievement, and one required holding constant students' school organization. With these controls, four of the five relationships indicated inverse relationships between levels of internality for negative events and rate of academically engaged learning time for language arts, mathematics, and a combination of the two subject areas. The other relationship indicated a direct relationship between level of internality for positive events and rate of academically engaged learning time for mathematics.

Although five statistically significant relationships were discovered, caution needs to be exercised in their interpretation. The reasons for this caution is that alpha was set at the .10 level which would in itself result in ten percent of a random sample of computations being found within this level of statistical significance. Since 126 such computations were performed, we should expect 12 to 13 "statistically significant" relationships in a random sample of tests.

This caution is somewhat diminished by two facts: 1) the computations were not random since they were based on hypotheses generated from the review of the literature, and 2) three of the relationships found to be significant involved inverse relationships between locus of control for negative events and rate of academically engaged learning time, self-directed instruction, and controls for ethnicity. The first fact diminishes the probability of finding statistically significant results below that expected from randomly performed computations thereby giving credence to the findings found in this study. Similarly, the second fact suggests a pattern of results which gives some credence to an indication that an inverse relationship between locus of control for negative events and rate of academically engaged learning time on self-directed instruction does exist when ethnicity is controlled.

In less technical language all of these factors result

in the following:

1. The data did not result in a sufficient number of statistically significant findings to be fully confident in generalizing from the sample used in this study to the population as a whole.
2. Nevertheless, there may be a pattern indicative of a tendency for those students who feel negative events are contingent upon their personal behavior to spend less time-on-task in self-directed instructional activity than do those who feel negative events are due to luck, chance, powerful others, fate, etc., and vice versa.

The literature. Chapter II provided the reader with an extensive review of the literature pertaining to locus of control, academic achievement, and time-on-task. A wide variety of relationships were reported between these and related variables in all manner of combinations. As such, relationships were noted between locus of control and the existence of learning disabilities, time utilization, persistence, expectations, motivation, other cognitive behaviors, and delayed gratification.

Most pertinent to this investigation was the work of Tobin and Capie (1982), who found student level of internality was related to the direct observation of rates of attending and total engagement in middle school science classes. Obviously, these relationships are not supported by this study.

The difference between the results of Tobin and Capie (1982) and those of this investigation may be due to one or both of two factors. First, whereas 60 percent of their population is described as "from homes of high socio-economic status" only 43 percent of the sample in this investigation did not qualify for free or reduced lunches (a program that requires very low family income in order to qualify). Secondly, the former study used the Transactions in Science engagement rating scale to quantify their observations versus this study's of the rating scale developed by Marliave et al. (1977). These scales are inherently different since the former has only one "off task" category while the latter has three. Further, the application of these scales in making the observations appears to be different to an unknown extent with their study suggesting a more liberal judgment of what is considered to be "engagement" than was the practice in the present study.

Summary

This chapter has presented an analysis of the data gathered in this study and a discussion of its implication. The results reported herein did not support the existence of a relationship between locus of control (for all, positive, and negative events) and rate of academically engaged learning time (for mathematics and language arts separately and together) either in general or when

controlled for the sex, ethnicity, socio-economic status, achievement, or school organization of the student. Possible differences between the professional literature and this study were noted.

Chapter 5

Summary, Conclusions, and Implications

This chapter provides the reader with a brief summary of the contents in chapters 2, 3, and 4. The chapter also presents conclusions that can be derived from this investigation and supports implications regarding future research in this area.

Summary

This dissertation has investigated the relationship between locus of control and academically engaged learning time. Although the professional literature reports relationships between each of these variables and academic learning, no reports were found wherein the relationship between these variables was directly studied. Chapter 2 reviewed the professional literature pertaining to the theoretical foundations of both locus of control and academically engaged learning time and the relationships demonstrated between measures of these concepts and behaviors related to academic learning.

Chapter 3 outlined the research methodology used in this study. As such, it described the sample used, the instruments administered, the gathering of data, the operational hypotheses and their corollaries, and how the data were analyzed.

Chapter 4 presented the actual analysis of the data. This analysis resulted in 5 statistically significant relationships out of 126 hypothesized computations. This ratio of significant to non-significant findings requires caution in interpreting and generalizing the overall results. On the other hand, the fact that three of these findings indicated that when ethnicity is held constant, locus of control for negative events is inversely related to rate of academically engaged learning time suggests that there may be a negative relationship between students' desires to feel personally responsible for the negative events in their lives and rate of attending to academic activities.

Conclusions

It is this author's opinion that any conclusions derived from this study must be made with caution. As indicated in chapters 2 and 4, the professional literature reports relationships between positive levels of internality and academic learning. It further reports relationships between academically engaged learning time and academic learning.

This study attempted to bring these two bodies of literature together. Although it was hypothesized that several relationships would be discovered, very few were.

Those tentative relationships that were noted would be consistent with the conclusion that higher levels of

internality for positive events and lower levels of internality for negative events tend to lead to greater rates of academically engaged learning time. The professional literature indicates this increased rate would then tend to lead to higher academic achievement.

Given the accuracy of these tendencies, one major conclusion is that behavior occurs as people perceive control over the positive reinforcers in their lives, not because of perceived control over the negative reinforcers. This implies that deterrents (punishers) are not as effective in controlling behavior as guidance (positive reinforcers).

Returning to the cautionary note stated previously, another major conclusion may be warranted. To the degree few significant relationships were discovered, this study suggests that rate of academically engaged learning time is not meaningfully related to characteristics of the students themselves. Because the professional literature includes a large amount of work reporting significant relationships between teachers' instructional behaviors and rate of academically engaged learning time, the literature in combination with this study suggests that classroom behavior is more determined by the teacher than the students. This implies greater teacher than student responsibility in the establishment of classroom management and climate.

Implications

The implications of this investigation divide into two primary areas. The first area focuses on where future research might best be of value. The second area focuses on the meaningfulness of the locus of control construct in contributing to our understanding of academic learning.

As noted in chapter 4, this study found only 5 out of 126 hypothesized relationships to be significant. Of these five significant relationships, three demonstrated an inverse relationship between internality for negative events and time-on-task when ethnicity was statistically controlled. Because these three relationships represent one-third of those controlling for ethnicity, and because this study utilized a naturalistic versus experimental design, further work in this area might be valuable. Beyond this one area though, it is felt that the research design and methodolgy used in this investigation was of sufficient internal and external validity that new data gathering or analysis of a different type would probably not generate different results.

The second implication of this study concerns the meaningfulness of using locus of control as a variable in studying learning. Although chapter 2 described several studies reporting statistically significant results between locus of control and learning, closer examination of these studies indicate that the correlation coefficients tend

to range between -.30 and +.30. This combined with the standard error of the correlation coefficient translates to the fact that less than 10 percent of the variance is being accounted for. In light of these relatively small correlation coefficients, this author concludes that locus of control adds limited meaning to the study of academic learning.

Bibliography

Altshuler, R., & Kassinove, H. (1975). The effects of chance instructional sets, schedule of reinforcement, and sex on children's temporal persistance. Child Development, 46, 258-262.

Anderson, L. W. (1975). Student involvement in learning and school achievement. California Journal of Educational Research, 26, 53-62.

Anton, T. A. (1981). Length of school day and school year--A comparison of California with other states. Unpublished manuscript, Lincoln Unified School District. Stockton, CA.

Barling, J. (1982). Self-determined performance standards and locus of control beliefs in children's academic performance. British Journal of Educational Psychology, 52, 100-103.

Barnett, M. A., & Kaiser, D. L. (1978). The relationship between intellectual-achievement responsibility attributions and performance. Child Study Journal, 8, 209-215.

Bar-Tal, D., & Bar-Zohar, Y. (1977). The relationship between perception of locus of control and academic achievement: Review and some education implications. Contemporary Educational Psychology, 2, 181-199.

Bar-Tal, D., Kfir, D., Bar-Zohar, Y., & Chen, M. (1980). The relationship between locus of control and academic achievement, anxiety, and level of aspiration. British Journal of Educational Psychology, 50, 53-60.

Battle, E. S., & Rotter, J. B. (1963). Children's feelings of personal control as related to social class and ethnic group. Journal of Personality, 31, 482-490

Bloom, B. S. (1971). Individual differences in school achievement: A vanishing point? Bloomington: Phi Belta Kappa.

Bloom, B. S. (1974). Time and learning. American Psychologist, 29, 682-688.

Bond, G. L., & Dykstra, R. (1967). The cooperative research program in first-grade reading instruction. Reading Research Quarterly, 2, 1-42.

Borg, W. R. (1980). Time and school learning. In C. Denham & A. Lieberman (Eds.), Time to learn, (pp 33-72). San Francisco: California Commission for Teacher Preparation and Licensing.

Brady, M. E., Clinton, D., Sweeney, J. M., Peterson, M., & Poyner, H. (1977). Instructional dimensions study. Washington D.C.: Kirschner Associates.

Caldwell, J. H., Huitt, W. G., & Graeber, A. O. (1982). Time spent in learning: Implications from research. Elementary School Journal, 82, 471-480.

Carroll, J. B. (1963). A model of school learning. Teacher's College Record, 64, 723-733.

Chapman, J. W., & Boersma, F. J. (1979). Learning disabilities, locus of control, and mother attitudes. Journal of Education Psychology, 71, 250-258.

Clifford, M. M., & Cleary, T. A. (1972). The relationship between children's academic performance and achievement accountability. Child Development, 43, 647-655.

Comprehensive tests of basic skills--Technical bulletin No. 1. (1974). Monterey: CTB/McGraw-Hill.

Comprehensive tests of basic skills--Technical bulletin No. 2. (1974). Monterey: CTB/McGraw-Hill.

Cooley, W. W., & Mao, B. J. (1981). The sample of classroom time observer. Journal of Classroom Interaction, 17, 31-36.

Crandall, V. C., Katkovsky, W., & Crandall, V. J. (1965). Children's beliefs in their own control of reinforcements in intellectual-academic achievement situations. Child Development, 36, 91-109.

Crandall, V. J., Katkovsky, W., & Preston, A. (1960). A conceptual formulation of some research on children's achievement development. Child Development, 31, 787-797.

Crandall, V. J., Katkovsky, W., & Preston, A. (1962). Motivational and ability determinants of young children's intellectual achievement behaviors. Child Development, 33, 643-661.

Davis, W. L., & Phares, E. J. (1967). Internal-external control as a determinant of information-seeking in a social influence situations. Journal of Personality, 35, 547-561.

Dishaw, M. (1977a). Technical note IV-2e: Descriptions of allocated time to content areas for A-B periods; Beginning teacher evaluation study. San Francisco: Far West Laboratory for Education Research and Development.

Dishaw, M. (1977b). Technical note IV-2b: Descriptions of allocated time to content areas for the B-C period: Beginning teacher evaluation study. San Francisco: Far West Laboratory for Education Research and Development.

DuCette, J., & Wolk, S. (1972). Locus of control and extreme behavior. Journal of Consulting and Clinical Psychology, 39, 253-258.

DuCette, J., & Wolk, S. (1973). Cognitive and motivational correlates of generalized expectancies for control. Journal of Personality and Social Psychology, 26, 420-426.

Dweck, C. S. (1975). The role of expectations and attributions in the alleviation of learned helplessness. Journal of Personality and Social Psychology, 31, 674 685.

Dweck, C. S., & Ruppucci, N. D. (1973). Learned helplessness and reinforcement responsibility in children. Journal of Personality and Social Psychology, 25, 109-116.

Erikson, R. V., & Roberts, A. H. (1971). Some ego functions associated with delay of gratification in male delinquents. Journal of Consulting and Clinical Psychology, 36, 379-382.

Feather, N. T. (1968). Change in confidence following success or failure as a predictor of subsequent performance. Journal of Personality and Social Psychology, 9, 38-46.

Fincham, F., & Barling J. (1978). Locus of control and generosity in learning disabled, normal achieving, and gifted children. Child Development, 48, 530-533.

Fisher, C. W., Filby, N. N., Marliave, R., Cahen, L. S., Dishaw, M. M., Moore, J. E., & Berliner, D. C. (1978) Technical report V-1: Teaching behaviors, academic learning time and student achievement: Final report of Phase III-B; Beginning teacher evaluation study. San Francisco: Far West Laboratory for Educational Research and Development.

Fredrick, W. C., & Walberg, J. J. (1980). Learning as a function of time. Journal of Education Research, 73, 183-194.

Gagne', E. E., & Parshall, J. (1975). The effects of locus of control and goal setting on persistence at a learning task. Child Study Journal, 5, 193-199.

Garrett, A. M., & Willoughby, R. H. (1972). Personal orientation and reactions to success and failure in urban black children. Developmental Psychology, 7, 92.

Gettinger, M., & White, M. A. (1979). Which is the stronger correlate of school learning? Time to learn or measured intelligence? Journal of Educational Psychology, 71, 405-412.

Gilbert, R. M., & Price, A. T. (1981). Is the school day long enough? Phi Delta Kappan, 63, 524.

Gordon, D. A. (1977). Children's beliefs in internal-external control and self-esteem as related to academic achievement. Journal of Personality Assessment, 41, 383-386.

Gordon, D. A., & Bolick, T. (1979). The role of self-reinforcement and causal attribution in children's task persistence. The Journal of Genetic Psychology, 135, 255-262.

Gorsuch, R. L., Henighan, R. P., & Barnard, C. (1972). Locus of control: An example of dangers in using children's scales with children. Child Development, 43, 579-590.

Gozali, H., Cleary, T. A., Walster, G. W., & Gozali, J. (1973). Relationship between the internal-external control construct and achievement. Journal of Educational Psychology, 64, 9-14.

Guthrie, J. T. (1982). Effective teaching practices. The Reading Teacher, 35, 766-768.

Hallahan, D. P., Gajar, A. H., Cohen, S. B., & Tarver, S. G. (1978). Selective attention and locus of control in learning disabled and normal children. Journal of Learning Disabilities, 11, 231-236.

Harris, A. J., Morrison, C., Serwer, B. L., & Gold, L. A. (1968). A continuation of the CRAFT project comparing reading approaches with disadvantaged urban Negro children in primary grades: Final report. New York: City University of New York, Division of Teacher Education.

Hisama, T. (1976). Achievement motivation and the locus of control of children with learning disabilities and behavior disorders. Journal of Learning Disabilities, 9, 387-392.

Holmes, H. W. (1915). Time distributions by subjects and grades in representative cities. In S. C. Parker (Ed.), The fourteenth yearbook of the national society for the study of education, Part 1; Minimum essentials in elementary school subjects--Standards and current practices. Chicago: University of Chicago Press.

Hopkins, K. D., & Glass, G. V. (1978). Basic statistics for the behavioral sciences. Englewood Cliffs: Prentice-hall Inc.

Joe, V. C. (1971). Review of the internal-external control construct as a personality variable. Psychological Reports, 28, 619-630.

Julian, J. W., & Katz, S. E. (1968). Internal versus external control and the value of reinforcement. Journal of Personality and Social Psychology, 76, 43-48.

Kanoy III., R. C. (1980). Locus of control and self-concept in achieving and underachieving bright elementary students. Psychology in the Schools, 17, 395-399.

Karabenick, S. A. (1972). Valence of success and failure as a function of achievement motives and locus of control. Journal of Personality and Social Psychology, 21, 101-110.

Karweit, N. (1976). A reanalysis of the effect of quantity of schooling on achievement. Sociology of Education, 49, 236-46.

Karweit, N., & Slavin, R. E. (1982). Time-on-task: Issues of timing, sampling, and definition. Journal of Educational Psychology, 74, 844-851.

Lahaderne, J. M. (1968). Attitudinal and intellectual correlates of attention: A study of four sixth-grade classrooms. Journal of Educational Psychology, 59, 320-324.

Lambert N. M., & Hartsough, C. S. (1976). APPLE observation variables and their relationship to reading and mathematics achievement: Beginning teacher evaluation study Phase II.

Lefcourt, H. M. (1966). Internal versus external control of reinforcement: A review. Psychological Bulletin, 65, 206-220.

Lefcourt, H. M. (1976). Locus of control--Current trends in theory and research. Hillsdale: Lawrence Erlbaum Associates.

Lefcourt, H. M. (Ed.). (1981). Research with the locus of control construct: Volume 1--Assessment methods. New York: Academic Press.

Lefcourt, H. M., Gronnerud, P., & McDonald, P. (1972). Cognitive activity and hypothesis formation during double entendre work association test as a fraction of locus of control and field dependence. Canadian Journal of Behavioral Science, 5, 161-173.

Lefcourt, H. M., & Ladwig, G. W. (1966). Alienation in negro and white reformatory inmates. Journal of Social Psychology, 68, 153-157.

Lefcourt, H. M., Lewis, L., & Silverman, I. W. (1968). Internal versus external control of reinforcement and attention in decision-making tasks. Journal of Personality, 34, 663-683.

Lefcourt, H. M., & Steffy, R. (1970). A level of aspiration, risk-taking behavior, and projective test performance; a search for coherence. Journal of Consulting and Clinical Psychology, 34, 193-198.

Lefcourt, H. M., & Wine, J. (1969). Internal versus external control of reinforcement and the deployment of attention in experimental situations. Canadian Journal of Behavioral Science, 1, 167-181.

Lewin, K. (1935). A dynamic theory of personality. New York: McGraw-Hill.

McGhee, P. E., & Crandall, V. C. (1968). Beliefs in internal-external control of reinforcements and academic performance. Child Development, 39, 91-102.

Mann, C. H. (1928). How schools use their time: Time allotment in 444 cities, including a study of trends from 1826-1926. New York: Columbia University, Teachers College.

Markwell, D. A. (1983). Instructional time in Medford Public Schools 549C. Unpublished manuscript, Medford Public Schools. Medford, Or.

Marliave, R. S., Fisher, C. W., Filby, N. N., & Dishaw, M. M. (1977). The development of instrumentation for a field study of teaching. Technical report I-5: Beginning teacher evaluation study. San Francisco: Far West Laboratory for Educational Research and Development.

Messer, S. B. (1972). The relation of internal-external control to academic performance. Child Development, 43, 1456-1462.

Meyers, C. E., Attwell, A. A., & Orpet, R. E. (1968). Prediction of fifth grade achievement from kindergarten test and rating date. Educational and Psychological Measurement, 28, 457-463.

Miller, M. B. (1962). Locus of control, learning climate, and climate drift in serial learning with mental retardates. Dissertation Abstracts International, 22, 2887. (University Microfilms No. 61-5815)

Mischell, W., Zeiss, R., & Zeiss, A. (1974). Internal-external control and persistance: Validation and implications of the Stanford preschool internal-external scale. Journal of Personality and Social Psychology, 29, 265-278.

Neilsen, L., & Long, M. (1981). Why adolescents can't read: Locus of control, gender, and reading abilities. Reading Improvement, 18, 339-345.

Nie, N. H., Hull, C. H., Jenkins, J. G., Steinbrenner, K., & Bent, D. H. (1975). SPSS statistical package for the social sciences (2nd ed.). New York: McGraw-Hill Book Company.

Nowicki, S. (1973). Predicting academic achievement of females from locus of control orientation: Some problems and some solutions. Paper presented at the meeting of the American Psychological Association, Montreal.

Nowicki, S. (1976). Factor structure of locus of control in children. Journal of Genetic Psychology, 129, 13-17.

Nowicki, S., & Strickland, B. R. (1973). A locus of control scale for children. Journal of Consulting and Clinical Psychology, 40, 148-154.

Passow, A. H., Noah, H. J., Eckstein, M. A., & Mallea, J. R. (1976). The national case study: An empirical comparative study of twenty-one educational systems. New York: John Wiley & Sons.

Payne, R. B. (1905). Public elementary school curricula. New York: Silver, Burdett, & Co.

Phares, E. J. (1957). Expectancy changes in skill and chance situations. Journal of Abnormal and Social Psychology, 54, 339-342.

Phares, E. J. (1976). Locus of control in personality. Morristown: General Learning Press.

Reid, I., & Croucher, A. (1980). The Crandall intellectual achievement responsibility questionnaire: A British validation study. Educational and Psychological Measurement, 40, 255-258.

Rosenshine, B. V. (1979). Content, time, and direct instruction. In P. Peterson & J. Walbert (Eds.), Research on teaching (pp. 28-56). Berkeley: McCutchan Publishing Corp.

Rosenshine, B. V. (1980). How time is spent in elementary classrooms. In C. Denham & A. Lieberman (Eds.), Time to learn (pp. 107-126). San Francisco: California Commission for Teacher Preparation and Licensing.

Rotter, J. B. (1954). Social learning and clinical psychology. Englewood Cliffs: Prentice-Hall, Inc.

Rotter, J. B. (1964). Clinical Psychology. Englewood Cliffs: Prentice-Hall, Inc.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs: General and Applied, 90, 1-28.

Rotter, J. B. (1972). Belief, social attitudes, and behavior: A social learning analysis. In J. B. Rotter, J. E. Chance, & E. J. Phares, Application of a social learning theory of personality (pp. 335-350). New York: Holt, Rinehart, and Winston, Inc.

Rotter, J. B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. Journal of Consulting and Clinical Psychology, 43, 56-67.

Rotter, J. B., & Chance, J. E., & Phares, E. J. (1972). Applications of a social learning theory of personality. New York: Holt, Rinehart, and Winston, Inc.

Rotter, J. B., & Multry, R. C. (1965). Internal versus external control of reinforcement and decision time. Journal of Personality and Social Psychology, 2, 598-604.

Rotter, J. B., Seeman, M., & Leverant, S. (1962). Internal versus external control of reinforcement: A major variable in behavior theory. In N. F. Wasburne (Ed.), Decisions, Values, and Groups (pp. 2). London: Pergamon Press.

Ryckman, R. M., Gold, J. A., & Rodda, W. C. (1971). Confidence ratings shifts and performance as a function of locus of control, self-esteem, and initial task experience. Journal of Personality and Social Psychology, 18, 305-310.

Seeman, M. (1963). Alienation and social learning in a reformatory. American Journal of Sociology, 69, 270-284.

Seeman, M., & Evans, J. W. (1962). Alienation and learning in a hospital setting. American Sociological Review, 27, 772-783.

Sherman, L. W., & Hofmann, R. J. (1980). Achievement as a momentary event, as a continuing state, locus of control: A clarification. Perceptual and Motor Skills, 51, 1159-1166.

Shu, T. C., & Feldt, L. W. (1969). The effect of limitations on the number of criterian score values on the significance level of the F test. American Educational Research Journal, 6, 515-527.

Snyder, L. E. (1982). Locus of control in learning-disabled and non-disabled students. Phi Delta Kappan, 1982.

Stipek, D. J., & Weisz, J. R. (1981). Perceived personal control and academic achievement. Review of Educational Research, 51, 101-137.

Strickland, B. R. (1972). Delay of gratification as a function of race of the experimentor. Journal of Personality and Social Psychology, 22, 108-112.

Strickland, B. R. (1973). Delay of gratification and internal locus of control in children. Journal of Consulting and Clinical Psychology, 40, 338.

Tesiny, E. P., Lefkowitz, M. M., & Gordon, N. H. (1980). Childhood depression, locus of control, and school achievement. Journal of Educational Psychology, 72, 506-510.

Tobin, K. G., & Capie, W. (1982). Relationships between formal reasoning ability, locus of control, academic engagement, and integrated process skill achievement. Journal of Research in Science Teaching, 19, 113-121.

Torgeson, J. K. (1977). The role of non-specific factors in the task performance of learning disabled children: A theoretical assessment. Journal of Learning Disabilities, 10, 27-33.

Walls, R. T., & Smith, T. S. (1970). Development of preference for delayed reinforcement in disadvantaged children. Journal of Educational Psychology, 61, 118-123.

Waters, D. (1972). Differential effects of skill and chance instructions on persistence time and attention breaks as a function of locus of control in elementary school children. Dissertation Abstracts International, 33, 2826B. (University Microfilms No. 72-32, 686)

Wiley, D. E., & Harnischfeger, A. (1974). Explosion of a myth: Quantity of schooling and exposure to instruction, major educational vehicles. Educational Researcher, 3, 7-13.

Williams, J. G., & Stack, J. J. (1972). Internal-external control as a situational variable in determining information seeking by Negro students. Journal of Consulting and Clinical Psychology, 39, 187-193.

Wolfgang, A., & Potvin, R. (1973). Internality as a determinant of classroom participation and academic performance among elementary students. Paper presented at the American Psychological Association, Montreal.

Wolk, S., & DuCette, J. (1973). The moderating effect of locus of control in relation to achievement motivation variables. Journal of Personality, 41, 59-70.

Wolk, S., & DuCette, J. (1974). Intentional performance and incidental learning as a function of personality and task directions. Journal of Personality and Social Psychology, 29, 90-101.

Wyne, M. D., & Stuck, G. B. (1982). Time and learning: Implications for the classroom teacher. The Elementary School Journal, 83, 67-75.

Zytkoskee, A., Strickland, B. R., & Watson, J. (1971). Delay of gratification and internal versus external control among adolescents of low socio-economic status. Developmental Psychology, 4, 93-98.

Appendix A

Intellectual Achievement Responsibility Scale (IARS)

1. If a teacher passes you to the next grade, would it probably be
   _____a. because she liked you, or
I+ _____b. because of the work you did?

2. When you do well on a test at school, is it more likely to be
I+ _____a. because you studied for it, or
   _____b. because the test was especially easy?

3. When you have trouble understanding something in school, is it usually
   _____a. because the teacher didn't explain it clearly, or
I- _____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
I- _____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
I+ _____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
I+ _____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
I- _____b. because you don't play well?

8. Suppose a person doesn't think you are very bright no matter what you do?
I- _____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
I+ _____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
I- _____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
I- _____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
I+ _____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
I+ _____b because you did a good job?

14. When you find it hard to work arithmetic or math problems at school is it
I- _____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
I- _____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
I+ _____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
I+ _____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
I- _____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
I- _____b. because you didn't study for it?

20. When you win at a game or cards or checkers, does it happen
I+ _____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
I+ _____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
I+ _____b. because your school work wasn't good enough?

23. Suppose you didn't do as well as usual in a subject at school. Would this probably happen
I- _____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
I+ _____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
I+ _____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
I- _____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
I- _____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
I+ _____b. because you studied your book well before you tried them?

29. When you remember something you heard in class, is it usually
I+ _____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
I- _____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
I+ _____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
I+ _____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
I- _____b. because you answered to 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
I- _____b. because your work wasn't as good as usual?

Appendix B

Code for Academically-Engaged Learning Time

EW = Engaged, written response

EO = Engaged, oral response (statement or question)

EC = Engaged, covert response
Engaged, covert responses includes any student response that is generally not observable. This includes most activities where the student is simply thinking, such as listening to the teacher or reading silently.

ED = Engaged, directions
The above categories for engaged learner moves must involve the substantive content of the reading or mathematics coded. Engaged, directions includes any written, oral, or covert student response that involves only the directions to the reading or mathematics activity.

NI = Not engaged, interim activity
Not engaged, interim activity refers to the non-academic interim tasks that are part of a reading or mathematics task. This includes sharpening pencils, turning in and passing out papers, and getting books.

NW = Not engaged, waiting for help
Not engaged, waiting for help refers to periods where the student has stopped working on a reading or mathemathics task because he is waiting for help.

NO = Not engaged, off-task
Not engaged, off-task refers to periods where the student is inappropriately disengaged for a reading or mathematics task. This would include socializing, daydreaming, and misbehavior during a reading or mathematics task.