THE EFFECTS OF LOCUS OF CONTROL AND TWO TYPES OF CLASSROOM CLIMATE ON STUDENT ACADEMIC ACHIEVEMENT AND SELF-CONCEPT

An abstract of a Dissertation by
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The problem. The purpose of this study was to determine whether children could benefit from differing educational environments either in a cognitive or affective sense. The relationships between two types of classroom climates and the locus of control personality construct were investigated. The dependent variables were the cognitive measures of reading achievement, mathematics achievement, and composite achievement scores and the affective measure of self-concept.

Procedure. This study was conducted in an independent suburban school district near a midwestern metropolitan area. The sample for the study was 125 sixth grade students enrolled in six selected classrooms during the 1977-78 school year. Three open and three non-open classrooms in the school district were selected for the study through the use of the Dimensions of Schooling Questionnaire Form VI. The DISC VI was used to assess the extent to which a school's program embodies the characteristics of open education. Locus of control scores were obtained through the use of the Children's Nowicki-Strickland Internal-External Scale. Measures of academic achievement were obtained from the Iowa Test of Basic Skills, Form 5. Self-concept measures were obtained through the use of the Coopersmith Self-Esteem Inventory.

A two-way analysis of covariance procedure was used to test for differences between means on the criterion measures of reading, mathematics, and composite achievement scores. A two-way analysis of variance procedure was used to test for differences between means on the criterion measure of self-concept.

Findings. In testing the research hypotheses at the .05 level, significant differences were found for all the criterion measures. Students with an internal locus of control scored significantly better than students with an external locus of control on the measures of reading and composite achievement. A significant difference was found for the measure of mathematics achievement. However, it could not be attributed to either locus of control or...
classroom climate. In this case, individual means were higher for the student with an internal locus of control and for the non-open classroom environment. Students with an internal locus of control also scored significantly better than students with an external locus of control on the measure of self-concept. These results indicate that students who believe they can, through their own efforts, accomplish desired goals, score significantly better on the criterion measures of self-concept and reading and composite achievement regardless of type of classroom climate.

Conclusions. Three general conclusions can be drawn from the findings of this study.

1. Students with an internal locus of control scored significantly better on the measure of reading achievement than students with an external locus of control regardless of the type of classroom climate.

2. Students with an internal locus of control scored significantly better on the measure of composite achievement than students with an external locus of control regardless of the type of classroom climate.

3. Students with an internal locus of control scored significantly better on the measure of self-concept than students with an external locus of control regardless of the type of classroom climate.
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Willard Gene Horak
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Chapter 1

INTRODUCTION

The educational era beginning in the 1960s brought about a revival of the concepts of progressive education, but with a new and hopefully more descriptive label—open education. Unfortunately, "open" has too often been used to describe only the physical features of the building. In this study the term "open education" did not refer to the architectural design of the building, but rather to the programmatic environment within the classroom. Open education is a strategy for influencing the cognitive and affective development of the student.

Proponents of the open educational setting suggest that it should allow for greater freedom of movement by the children, increase positive experiences, enhance pupil choice in work tasks, integrate subjects, facilitate cooperation, and stimulate creativity. Opponents criticize its permissiveness and the decline in educational standards while promoting the academic gains of students in non-open, more traditional settings in which the teacher assumes a didactic approach, competition is encouraged, subjects are encountered as separate entities, and adherence to behavior standards is encouraged.

The present debate has centered around an either/or view of education. There is, however, a growing body of
educators who question such simplistic arguments. This researcher believes that there is no one method of education that is consistently superior or inferior to alternative approaches. Rather, the individual differences of pupils should provide the guide for selecting the most appropriate setting for each child. This study investigated the relationships between differing educational settings and the locus of control personality construct. It examined the relationships with respect to academic achievement and student self-concept.

Definitions

**Self-concept**: The evaluation which an individual makes and customarily maintains with regard to himself: it expresses an attitude of approval or disapproval, and indicates the extent to which the individual believes himself to be capable, significant, successful, and worthy. Self-concept is a personal judgment of worthiness that is expressed in the attitudes the individual holds toward himself.¹

**Internal locus of control**: Internal locus of control refers to the perception of positive and/or negative events

as being the consequence of one's own actions and thereby under personal control.  

**External locus of control:** External locus of control refers to the perception of positive and/or negative events as being unrelated to one's own behavior in certain situations and therefore beyond personal control.  

**Open classroom:** The open classroom is characterized by the following: integrated subject matter, teachers as guides to educational experiences, active pupil roles, pupil participation in curriculum planning, learning by discovery techniques, absence of external rewards and punishments, decreased concern with conventional academic standards, little testing, accent on cooperative group work, teaching not confined to the classroom, and accent on creative expression.  

**Non-open classroom:** The non-open classroom is characterized by the following: separate subject matter, teachers as the distributors of knowledge, passive pupil roles,  

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2 Ibid.  

roles, lack of pupil input in curriculum planning, accent on memory, practice, and rote, external rewards and punishments, concern with academic standards, regular testing, accent on competition, teaching confined to the classroom, and little emphasis on creative expression.¹

**Rationale**

The concept of open education has been embraced by educators as a method of correcting the educational woes of present educational systems.² There is, however, an alarming lack of research to support the contention that open education will best serve all children. Rogers³ notes that there is a concern among educators for more concrete evidence on the value of open education.

Review of the professional and popular literature on open education reveals several common themes. Ewald B. Nyquist⁴ draws upon the thinking of Roland Barth and

¹Ibid.


Charles Rathbone in characterizing open education:

Open education is a way of thinking about children, about learning, and about knowledge. It is characterized by openness and trust; by spatial openness of doors, and rooms; by openness of time to release and serve children, not to constrain, prescribe and master them. The curriculum is open to significant choice by adults and children as a function of the needs and interests of each child at each moment. Open education is characterized by an openness of self. Persons are openly sensitive to and supportive of other persons—not closed off by anxiety, threat, custom and role. Administrators are open to initiatives on the part of teachers; teachers are open to the possibilities inherent in children; children are open to the possibilities inherent in other children, in materials, and in themselves.

In short, open education implies an environment in which the possibilities for exploration and learning of self and of the world are unobstructed.

In agreement, Robert H. Anderson lists these basic tenets of open education. Openness implies:

1. The removal of restriction, impediments, habits, frameworks, locksteps, regulation, pressures, and other clutter that reduces options and opportunities for the maximum and optimum development of children.

2. Human beings should treat each other with respect, acceptance, and trust. Humaneness is a central value of open education.

3. Both the child and the teacher should achieve and exhibit a high degree of self-understanding and self-acceptance in order to foster optimal growth and high productivity.

4. A teacher is not so much the manager and director, but the facilitator of learning.

5. Each child is different and therefore needs different treatment to develop his full potential.¹

Finally, Roland S. Barth discusses the assumptions which he perceives to be among the salient features of open education. Among them are:

1. The child will display natural exploratory behavior if he is not threatened.

2. Confidence in self is closely related to capacity for learning and for making important choices affecting one's learning.

3. Children have both the competence and the right to make significant decisions concerning their own learning.

4. Children will be likely to learn if they are given considerable choice in the selection of the material they wish to work with and in the choice of questions they wish to pursue with respect to those materials.

5. When a child learns something which is important to him, he will wish to share it with others.

6. The best measure of a child's work is his work.1

In open education children are given the opportunity to become involved in their education. The open school then is the one in which students under the guidance of the teacher have many opportunities to assume and exercise responsibility and to draw upon many resources in the choice, initiation, direction, and evaluation of their learning experiences.

It is assumed that the open atmosphere is less threatening than other educational structures, with the

result being that the child will come to direct his own learning experiences and will learn more fully and with less trauma. Open programs encourage students to assume more active roles, to initiate plans and undertake projects independently, to participate in self-evaluation, and to make significant choices about the style and pace of learning.

Arthur Combs suggests that modern education must produce far more than persons with cognitive skills. It must produce humane individuals, persons who can be relied upon to pull their own weight in our society, who can be counted upon to behave responsibly and cooperatively. Silberman concurs, "What tomorrow needs is not masses of intellectuals, but masses of educated men--men educated to feel and to act as well as to think."

A discrepancy exists between the behavior of individuals in society and what they have learned in schools; the global behavioral objectives have been overshadowed by the narrow subject-matter objectives. John Goodlad has

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3 Silberman, op. cit., p. 7.
stated this predicament clearly:

Little effort has been made to determine the ultimate aims of schooling and the respective contribution each discipline can make to them. Instead, the objectives of schooling have become the composite of the objectives for each subject. ...The goals of today's schools do not extend beyond those subjects that have succeeded in establishing themselves in the curriculum.¹

Rarely is the curriculum designed to help the student deal in personal terms with the problems of human conduct.

Weinstein and Fantini have provided some insight into the problem. "It is easier to teach toward such specific objectives than it is to recognize and deal with the child's need for a satisfying self-definition, for constructive relationships with others, and for some control over what happens to him."²

Finally, Louis J. Rubin writes, "In teaching we may separate feeling and thought in order to deal with one or the other somewhat more precisely, but unless they are once again conjoined—somewhere in the instructional process—school is unlikely to have much effect on the ways in which children respond to their life situations."³ Children must


be personally touched by the educational process so that as a result of their life in school they may become a fully functioning person.

Concerned with failure to meet this need Clark Moustakas writes about the child becoming alienated from his real self by the constraints placed upon him by parents and schools. In explaining how the child becomes separated and detached he writes:

Desensitization occurs through a process of deprivation and separation, where one is treated as an object; where skills and subject matter are more significant than learners, where goals must be pursued regardless of the real wishes, aspirations, and capacities of persons; where rationalizing, explaining and analyzing takes the place of spontaneity, humanistic experience and natural feeling.

Similarly, Silberman writes about the mutilation of the elementary child:

It is not possible to spend any prolonged period visiting public school classrooms without being appalled by the mutilation visible everywhere—mutilation of spontaneity, of joy in learning, of pleasure in creating, of sense of self.

To make learning a more pleasurable and meaningful experience it is necessary that the individual child be personally touched by the educational process. Combs concedes, "The humane qualities we seek in education, such as


2 Silberman, op. cit., p. 10.
positive self-concepts, feelings of identification, respons-
ibility, openness to experience, adaptability, creativity, ef
fective human relationships are, like any other behavior, out
comes of personal meaning."¹ It is apparent that there is no way to separate a child's education from his emotional self. Rubin contends "Reason and emotion are of a piece."²

The concern for affect must become a fundamental part of the curriculum to insure the development of a fully functioning or adequate person. Combs and Snygg³ have addressed themselves to the kinds of perceptions that are typical of the adequate personality: (1) an essentially positive regard for self, (2) the capacity for acceptance of self and of others, and (3) the ability to identify broadly with other people.

Donald W. Felker⁴ sees self-concept as the sum total of the view which an individual has of himself. Self-concept is a unique set of perceptions, ideas, and attitudes which an individual has about himself.

¹Combs, Educational Accountability, op. cit., p. 23.

²Rubin, op. cit., p. 7.


More recently, Combs has indicated these four basic qualities which contribute to the dynamics of self-actualizing personalities. Self-actualizing persons are:

1. well informed,
2. possessed of positive self-concepts,
3. open to their experience, and
4. possessed of deep feeling of identification with others.

Since self-concept is based on experiences of the child in which he can see himself in positive ways in dealing with life and in relations with others the schools should foster such growth as is possible. Combs states that people learn who they are and what they are from the ways in which they have been treated by those who surround them in the process of growing up. Open education is an educational system designed to enhance their growth.

In the open educational system children are given the opportunity to become involved in their education. They are encouraged to react to the influences in their environments and to adjust their learning patterns.

Literature concerning internal-external locus of control indicates that it is highly associated with a child's ability to interact with and learn from his

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1 Combs, Educational Accountability, op. cit., p. 53.
2 Ibid.
DuCette and Wolk\(^2\) have reported that internal subjects are more sensitive to environmental stimuli; they demonstrate the ability to use experience with a task to improve their perception of performance and generally learn more quickly from their environment. According to Lintner and DuCette\(^3\) locus of control is an expectancy variable that refers to a person's perception of the relationship between actions and outcomes.

McGhee and Crandall view internal-external locus of control as the degree to which a person perceives his reinforcement as contingent upon his behavior or independent of it.

Individuals who more often see the reinforcements they receive as caused by their own instrumental behaviors have been termed "internals." "Externals" are those who believe that their reinforcements are caused by agents outside themselves, forces over which they have no control.

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Individuals with external orientations may attribute causality to any number of forces such as luck, fate, chance, supernatural powers, task or situation characteristics, complex social and political processes, powerful others, etc.¹

An internal person believes that he is in control of his life and that work and effort will result in reward. An external person believes that life is determined by chance and that rewards are distributed in a more or less random fashion without a relationship between action and outcomes. The child will not learn from his experiences unless he believes that these experiences are lawfully related to his own actions. Lefcourt states,

Some individuals develop unshakeable beliefs that valued reinforcements occur only by chance and that men are not the masters of their fates. In contrast others may strongly believe that man is responsible for his fate. Persons with such contrasting perspectives differ considerably in the degree to which they are able to assimilate and learn from their experiences.²

An internal person, believing that actions and outcomes are correlated, will be likely to expend the necessary effort to achieve a goal if he perceives that the goal is attainable. He will persist despite failure, he will actively seek and process information, he will explore alternatives, and, in general, will perform those behaviors


²Lefcourt, Locus Of Control, op. cit., p. 31.
which will lead him to his objectives. An external person, on the other hand, who perceives no correlations between action and outcomes, will not exhibit corresponding behaviors.

McGhee and Crandall\(^1\) conclude that the degree to which a child believes that his own behavior is responsible for his academic successes and failures will affect his instrumental effort to attain these goals. The child who feels that success or failure is a consequence of his own behavior should show greater initiative in seeking intellectual rewards and greater effort and persistence in intellectual tasks and situations. Conversely, the external child, who feels that his rewards and punishments are given him at the whim or design of other people or circumstances, has little reason to exert effort in an attempt to increase the probability of obtaining reward and avoiding punishment.

Finally Halsted, Bober, and Streit\(^2\) conclude that the child with an internalized locus of control will achieve better both academically and interpersonally in the open classroom. Any failure of these children in the open classroom model will permit them to gather feedback and modify both their cognitive and affective domains. Conversely, the

\(^1\)McGhee, op. cit., pp. 92-93.

\(^2\)Donald L. Halsted, Anne Marie Bober, and Fred Streit, "Open Classroom: A Panacea?", The Educational Forum, XLI (May 1977), 489.
external child, who lacks the ability to obtain and use feedback from such an environment, might benefit more from a non-open, traditional classroom, where teachers are trained to aid children in learning from direct input rather than from feedback from the environment.

Statement of the Problem

The purpose of this study was to determine whether children can benefit from differing educational environments either in a cognitive or affective sense. This study was concerned with the following questions: (1) Are there differences in the academic achievement between children with an internal or external locus of control in both open and non-open classrooms? (2) Are there differences in the perception of self-concept between children with an internal or external locus of control in both open and non-open classrooms? (3) Are there differences in academic achievement between internals and externals in open environments? (4) Are there differences in self-concept between internals and externals in open environments? (5) Are there differences in academic achievement between internals and externals in non-open environments? (6) Are there differences in self-concepts between internals and externals in non-open environments?
Hypotheses

1. There is no mean difference in reading achievement, adjusted for IQ, between internal and external students in open and non-open school environments.
2. There is no mean difference in mathematics achievement, adjusted for IQ, between internal and external students in open and non-open school environments.
3. There is no mean difference in composite achievement scores, adjusted for IQ, between internal and external students in open and non-open school environments.
4. There is no mean difference in self-concept scores between internal and external students in open and non-open school environments.

Assumptions

This study assumes that:
1. Reinforcement is a major determinant of behavior.
2. Children can perceive a relationship between their behavior and the reward.

This study further assumes that affect and feelings are measurable traits and:
1. They are influenced differently in open and non-open classrooms.
2. They can be reflected in the self-reports of the children.
3. They are influenced by certain characteristics of the classroom environment.

Limitations

The findings of this study will be limited by the following:

1. The composition of the population of upper elementary children attending open and non-open classrooms.
2. The reliability and validity of the measuring instruments.

Significance of the Study

The findings of this study may serve several purposes: First, this study should suggest possibilities for future research in education. If a relationship is identified between locus of control and classroom environments future studies will be necessary to substantiate the findings. Additionally, the aspects of open education which appear to be most significantly related to locus of control will need to be identified. Then identifiable components of open education may be correlated with internal/external locus of control to find those which may positively influence each individual's education. The internal/external locus of control may prove to be related to self-concept and future use as a predictor of success in school may be possible. Components which influence internal locus of
control could also be identified to enable teachers to adopt teaching styles to foster internal control development. Various populations, such as gifted, retarded, handicapped, and learning disabled, could be used in similar studies. Analysis of relationships between external variables such as number of years in specific classroom environments may be studied.

Second, it should also be beneficial in helping classroom teachers in identifying classroom climates suited to the individual characteristics of the students. Furthermore, the identifiable components of open classrooms which aid in developing internal control or high self-concepts can be adapted to many classroom situations.

Third, this study could be used by school administrators who are contemplating open enrollment policies as a means of providing alternatives in education. It may prove beneficial for assigning students to those classroom types which will provide the atmosphere most conducive to student growth.

Fourth, it should be valuable for students in teacher education in enabling them to select or adopt classroom or instructional styles. It could provide insight into the interactions between organizational structures and pupil individual differences.
Chapter 2

REVIEW OF THE RELATED LITERATURE AND RESEARCH

Introduction

This chapter presents an examination of the literature and research of importance to this study. The first section examines the concept of open education through a brief review of the background and several attempts to arrive at a definition. Section two defines self-concept and explains its major characteristics. The third section examines the locus of control of reinforcement construct and its uses in research. The remaining three sections deal with the research on the effects of locus of control on achievement and self-concept, the effects of open education on achievement and self-concept, and the interaction of locus of control and instructional style.

Open Education

Open education arrived on the American educational scene in the late 1950s and early 1960s and was immediately hailed as the reform movement that would substantially change the educational experience of children throughout the United States. It is, however, not without historical antecedents. Many of its underlying principles date back to the Greek philosophers who spoke against the harsh discipline in the
schools, the narrowness of the curriculum, and the memorization of facts.

Socrates, in his teaching, employed an "inquiry" or "discovery" approach. Plato and Aristotle urged the consideration of the whole child, the body as well as the mind, and acknowledged the importance of play for children. The child-centered approach, advocated by Jean Jacques Rousseau, urged schools to provide opportunities for the child to use his natural abilities and interests, to allow the child to develop naturally.

J. H. Pestalozzi extended the theories upon which open education is based by emphasizing the child's experience as the foundation for knowledge and the importance of experimenting with concrete objects before the child can move to abstract ideas. Later, Friedrich Frobel and Johann Friedrich Herbart added to the philosophical base by stressing concern for the individual child's needs and reliance on the child's interest as motivating factors in education. Froebel founded the first kindergarten where children learned through play and participation and the teacher offered guidance and structure.

In the early twentieth century, John Dewey, writing in *The Child and the Curriculum*, expressed similar beliefs about the nature and growth of the child.¹ The heart of

Dewey's philosophy was the concept of experience. Education began with a problem which the child was motivated to solve and through experience and interaction with the environment the child would seek to resolve the problem. Dewey's views formed the basis for the progressive-education movement of the 1920s and 1930s in the United States.

Many other educators were also associated with the progressive movement in education. Among the more notable contributors were Maria Montessori whose schools stressed individual attention to each child within an environment in which a child was free to choose his activities; Carl Rogers who believed that the child could be trusted to assume responsibility for his own learning; and Jerome Bruner who, recognizing curiosity as a motivating force, advocated a "discovery" approach to learning.

Theories on child development have also been identified with the movement of open education. Of primary importance is the work of Jean Piaget, a Swiss psychologist, who stressed the direct role of concrete experience in learning and the consecutive stages of mental development of children. His influence is particularly felt in the development of the British informal school.

American supporters of open education often point to the British infant school as a model. Over 25 percent of British "infant" or primary classrooms for children ages
five through seven now follow the open education plan.¹
Open education programs were begun in Britain following
World War II and were evaluated by the British government
in the 1960s. The committees report, Children and Their
Primary Schools, also known as the Plowden Report, states:
"At the heart of the educational process lies the child.
No advances in policy, no acquisitions of new equipment
have their desired effect unless they are in harmony with
the nature of the child, unless they are fundamentally
acceptable to him."²

The move towards open education in the United States
has followed the criticisms of Silberman, Holt, and Kozol³
who decried the depersonalization of schooling, the repeti-
tion and routine which bore students. Their writings led
educators to seek alternatives and it was the British infant
school and the Plowden Report that appeared to offer a
significant model for improving American education.

Roland S. Barth in "When Children Enjoy School"

¹Heather S. Doob, Summary of Research on Open Educa-

²Central Advisory Council for Education (England),
Children and Their Primary Schools, Vol. I (London: Her

³Charles E. Silberman, Crisis in the Classroom (New
York: Random House, 1970); see also John Holt, How Children
Fail (New York: Pitman, 1964); Jonathan Kozol, Death at an
Early Age (Boston: Houghton Mifflin, 1967).
suggests that there is more to the open education movement than humanism and acceptance of diversity. What binds the proponents of open education together is a way of thinking and similar beliefs about children, learning, and knowledge.¹ Through a review of the literature on open education Barth has collected 29 assumptions about open education and tested them with educators in Britain and the United States.² He has found a high degree of agreement that these assumptions are closely related to open education practices.

In developing a teacher questionnaire to describe open education in terms of observable characteristics of school programs, Traub, Weiss, Fisher, and Musella adapted Barth's assumptions as follows:

1. Children are innately curious.

2. Children will explore their environment provided it is non-threatening.

3. Children have the competence and the right to make significant decisions concerning their own learning.

4. Children who learn something of importance to themselves wish to share it with others.

5. Children develop intellectually at their own pace and in their own style.


6. Intellectual growth and development best take place in a sequence of concrete experiences followed by abstractions.

7. Errors are an essential part of learning.

8. A child's learning is best assessed by close observation over a long period of time.¹

From their analysis of the assumptions, Traub et al. isolated several general outcomes as those of importance in open education: communication skills, number skills, problem-solving skills, decision-making skills, knowledge of basic concepts, openness to new situations, self-instruction skills, divergent thinking, cooperation in group problem-solving, resourcefulness, self-perception, personal and cognitive styles, and self-others frame of reference.² Using these assumptions and general outcomes their questionnaire was based on those characteristics of school programs that would be likely to influence the development of open education outcomes. These aspects of school programs include: setting instructional objectives, materials and activities, physical environment, structure for decision-making, time scheduling, individualization of instruction, composition of classes, role of teacher, student evaluation, and student control.³


²Ibid.

³Ibid.
In a similar fashion, Herbert J. Walberg and Susan Christie Thomas arrived at their eight open education themes. They include: provisioning for learning; humanness, respect, openness, and warmth; diagnosis of learning events; instruction, guidance, and extension of learning; evaluation of diagnostic information; seeking opportunities for professional growth; self-perception of teacher; and assumptions about children and the learning process.¹

Many writers on the educational scene have offered their conceptions about the nature of open education. Barbara Blitz writes:

Whatever the particular outward form of the open classroom, the essential thought behind it is that children are unique, physically active individuals, and that their learning needs can only be met in a free, active atmosphere which tailors the learning environment to the specific needs and abilities of each child.²

Don Tunnel, in "Open Education: An Expression in Search of Definition," offers this definition of open education. Open education is that form of educational practice which is characteristically regulated by the following rules:


1. Students are to pursue educational activities of their own choosing.

2. Teachers are to create an environment rich in educational possibilities.

3. Teachers are to give a student individualized instruction based on what he/she is interested in, but they are also to guide the student along educationally worthwhile lines.

4. Teachers are to respect students.¹

With reference to the basic philosophy of the open classroom, Lee L. Smith indicates that each child has the potential for many types of growth. If children are to develop their intellectual potential, the school must provide an environment that is intellectually stimulating and in which achievement of an intellectual nature is respected and nurtured.² The emotional climate of a learning situation determines how well the pupil will obtain functional behavioral changes.

Lillian S. Stephens, in The Teacher's Guide to Open Education, suggests this definition with the emphasis on the word "open":

Open education is an approach to education that is open to change, to new ideas, to curriculum, to scheduling, to use of space, to honest expressions of feeling between teacher and pupil and


between pupil and pupil, and open to children's participation in significant decision-making in the classroom.¹

In "Opening Up Education: A Guide to New Vocabulary," Rita Tatis provides a more expanded definition:

Open education is a method of fostering the personal growth and expansion of knowledge of students through (a) expanded and/or flexible facilities such as interest centers within self-contained classrooms, new open-plan schools, or community facilities; (b) trust in the student's desire to learn and ability to choose his own learning experiences; (c) provision of many and varied learning materials; and (d) emphasis on a positive role for the teacher as a facilitator and guide to learning.²

In a series of articles published in The New Republic in 1967 Joseph Featherstone speaks to the "profound and sweeping revolution in English primary education, involving new ways of thinking about how young children learn, about the classroom organization, and about the curriculum and the role of the teacher."³ Children are given the opportunity to explore and experiment, to work in


groups in hallways, classroom corners, on the playground, to follow their interests and make definite choices according to their needs, and to experience the warmth and guidance of understanding teachers.

Charles Silberman sums it up with this short, yet comprehensive definition. "Open education is a set of shared attitudes and convictions about the nature of childhood, learning, and schooling."

Self-Concept

Many educators have come to accept the idea that how a person feels is more important than what he knows. Knowledge is used in behavior but the positive or negative feelings one experiences determines its use. Consequently, the proponents of open classrooms are stressing the importance of the affective outcomes of schooling such as self-concept, humanism, creativity, school morale, and social structure.

The major basis for Stanley Coopersmith's study on self-esteem was the widely held belief that self-esteem is significantly associated with personal satisfaction and effective functioning. In defining self-esteem Coopersmith writes:

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1Silberman, op. cit., p. 208.
By self-esteem we refer to the evaluation which the individual makes and customarily maintains with regard to himself. It expresses an attitude of approval or disapproval, and indicates the extent to which the individual believes himself to be capable, significant, successful, and worthy.¹

Others have also defined the self-concept in a similar fashion. Dorothy Rogers states "Each child comes to feel some way about his roles. He concludes that he plays them well, or poorly, or just moderately well. In short, he acquires a self-concept, which embraces all his impressions and beliefs about himself."²

In agreement Robert M. Oswald in The Development and Function of Personality concludes: "The Self-concept develops into a complicated system that includes not only the body image but also all of the thoughts, feelings, attitudes, values, and aspirations about self."³

In attempting to answer the question "What is the Self?" Arthur T. Jersild writes: "The self is a composite of thoughts and feelings which constitute a person's awareness of his individual existence, his conception of who and


what he is. A person's self is the 'sum total of all that he can call his'.

Arthur W. Combs views the self-concept in terms of the adequate personality. He states:

Extremely adequate, self-actualizing persons seem to be characterized by an essentially positive view of self. They see themselves as persons who are liked, wanted, acceptable, able; as persons of dignity and integrity, of worth and importance.

Various characteristics of the self-concept have been identified by writers in the field. One of the most noted is the basic need of all persons for adequacy. If self-concept is an organization of self meanings or ways of seeing self than a basic need of each of us is to maintain and enhance this self. Adequate persons have achieved a considerable degree of such need satisfaction.

Carl R. Rogers writes on becoming a fully functioning person:

I find such a person to be sensitively open to all of his experiences—sensitive to what is going on in his environment, sensitive to individuals with whom he is in relationship, and


sensitive perhaps most of all to the feelings, reactions, and emergent meanings which he discovers in himself.¹

A second common characteristic concerns the consistency with which one's perceptions agree with the self-concept. A strong self-concept helps a child believe in and rely upon himself. A healthy self-concept strengthens the child's capacity to cope with his environment. When confronted with a problem the child will attempt to arrive at a solution in accord with his view of his capabilities.

Coopersmith, in studying self-esteem across different areas of experience concurs: Children make little distinction about their worthiness in different areas of experience or, if such distinctions are made, they are made within the context of the over-all, general appraisal of worthiness that the children have already made.²

Referring to consistency, Diggory³ notes that things are better learned and remembered if they are consistent with one's beliefs. When a person's feelings of self are involved in a situation he tends to rate his performance higher and hold securely to his opinions.


²Coopersmith, op. cit., p. 6.

Statements and actions are designed to retain the favorable opinion of others and are consonant with the perception of self.

That a student's achievement is closely related to his perception of self and is consistent is reported by Don E. Hamachek.

Increasing evidence indicates that student failures in basic school subjects may be due in part to unhealthy perceptions of the self and the world. Many students have difficulty in school not because of low intelligence or poor eyesight, but because they have learned to consider themselves unable to do academic work. This seems to be equally true in special school activities, such as athletics, dramatics, club participation, or public speaking.¹

A third characteristic pointed out by Combs indicates that the self-concept is learned.

The self is achieved. It is learned as a consequence of the kinds of experiences individuals have in the years of their growing up and this, of course, includes the school years. What is more, the self-concept is involved and modified by every life situation in which the individual moves.²

Learning about the self begins as the infant attempts to find order in his environment. Oswald states that the most basic ideas about self come from the comments of others. To a large degree, one's self-concept is made


²Combs, Perceiving, op. cit., p. 92.
up of the reflected appraisal of others. If the self is learned as a function of experience, then children learn about themselves in the classroom.

Louis J. Rubin suggests that the proper function of schooling ought to be that of making human beings better. It may be more desirable to have a school in which a child learns to know himself and his world, than to have a school in which a child learns to earn a living.

Combs and Snygg speak of change in the self-concept through reactions to experience. It is probable that throughout the lifetime of the individual change is constantly occurring in the self-concept as he perceives the reactions of others to himself. In a sense, this is like learning about the self through a mirror.

Accurate, realistic conceptions of self are learned. Since they are learned they are teachable. For the most part, learning about self is a product of interaction with human beings.

Additional characteristics of self-concept include openness. This refers to a willingness to confront reality.

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1Oswald, op. cit., p. 9.


3Combs and Snygg, op. cit., p. 157.

4Combs, Perceiving, op. cit., p. 119.
Combs notes that "open people are free to devote their energies to what is positive and constructive. They can and do set more realistic goals for themselves." Hence, they should experience a greater degree of success.

The self-concept is amenable to change. Combs and Snygg indicate an individual's own fundamental need requires change in his concepts of self. To be a truly adequate person one must be able to adapt to the changes in the world around him. "An adequate self must be stable but not rigid; it must be changing but not fluctuating."

Stability is another characteristic of one's self-concept. Once a belief is established in a personality, a high degree of stability becomes apparent. A rapidly changing self would not provide the kind of stable frame of reference the individual needs in order to deal with life effectively and efficiently. Generally, it is only through the repetition of many experiences of adequacy and with much praise and encouragement that a change in the self-concept can be achieved.

While each person's self is something individual it has social origins. It is learned through the social

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1 Ibid., p. 118.
2 Combs and Snygg, op. cit., p. 130.
3 Ibid., p. 130.
interaction with others from infancy. This fact has important meanings for education because many of the strongest social influences are brought to bear upon the child by way of his experiences in school. Jersild\textsuperscript{1} concurs that the self is basically a social structure arising out of social experience.

Equally important in the development of self-esteem is a history of successes. They form the basis in reality for self-esteem and are evaluated in material ways and through social acceptance. Coopersmith, through extended interviews and previous studies, proposes four different types of experiences that may be employed to define success. They are:

1. Power - the ability to influence and control others,
2. Significance - the acceptance, attention, and affection of others,
3. Virtue - adherence to moral and ethical standards,
4. Competence - successful performance in meeting demands for achievement.\textsuperscript{2}

Experiences of the individual are interpreted and modified in accord with his values and aspirations. Individuals differ in the importance they attribute to the successes they have in various areas of experience, and these

\textsuperscript{1}Jersild, op. cit., pp. 11-12.

\textsuperscript{2}Coopersmith, op. cit., p. 38.
differences are largely a function of the values they have internalized from parents and significant others.¹

A factor in the development of self-esteem is the individual's manner of responding to devaluation. The defenses to the inconsistencies between reality and self-concept can assume many different mechanisms. The individual generally uses defenses similar to those he learns in his immediate environment or those utilized by persons close to him. Coopersmith concludes: "A defense is not only a means of warding off anxiety, it is also a definition and interpretation that precedes an event and leads the individual to assume a more or less active and assertive posture."²

In speaking about humanistic education Arthur W. Combs suggests self-actualization as the primary goal of education. "We need good citizens, free of prejudice, concerned about their fellow citizens, loving, caring...persons of goodwill whose values and purposes are positive...The humane qualities are absolutely essential to our way of life."³ In agreement, Louis J. Rubin states:

If we are interested in influencing children's behavior, we shall continue to fail so long as we rely upon cognitive instruction alone. If the school is to truly influence behavior, it must

concern itself with the broader range of feeling, thinking, and valuing.\(^1\)

In noting the importance of school in the development of a positive self Jersild writes: "It is reasonable to assume that for many young people school is second only to the home as an institution which determines the growing individual's concept of himself and his attitudes of self-acceptance or self-rejection."\(^2\)

Finally, the importance of affective concerns in the school curriculum is stressed by Earl C. Kelley.

We, in education, are slowly waking up to the fact that feelings are really important. There is much discussion of the self-concept, the self-image, and the fact that if one thinks too little of himself he becomes immobile and unable to learn.\(^3\)

### Locus of Control

In 1966 Julian B. Rotter introduced the Internal-External scale as a measure of individual differences in the generalized belief that a person can control his own destiny. As a general principle, internal control refers to the perception of positive and/or negative events as being a consequence of one's own actions and thereby under personal

\[^{1}\text{Rubin, op. cit., p. 28.}\]

\[^{2}\text{Jersild, op. cit., p. 90.}\]

\[^{3}\text{Earl C. Kelley, "The Place of Affective Learning," Education for Affective Achievement, eds. Strom and Torrence, op. cit., p. 255.}\]
control; external control refers to the perception of positive and/or negative events as being unrelated to one's own behaviors in certain situations and therefore beyond personal control.\(^1\)

In reiterating the basic conceptualization DuCette and Wolk\(^2\) write: Locus of control was originally conceived as a mediating expectancy variable which primarily affects learning. An internal person has an expectancy that the environment is open to personal manipulation and that a relationship exists between his actions and his reinforcements. An external person, on the other hand, expects to be under the control of others and expects that effort does not necessarily result in reward. Thus an internal child, because he has come to expect that actions and outcomes are related, responds adaptively to reinforcement; an external child does not.

The concept of internal-external control of reinforcement was originally developed from Rotter's social learning theory. It describes the degree to which an individual believes that reinforcements are contingent upon his own behavior.

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Herbert M. Lefcourt\textsuperscript{1} reviews Rotter's theory in his recent publication \textit{Locus of Control: Current Trends in Theory and Research}. According to Rotter's theory, a person's actions are predicted on the basis of his values, his expectations, and the situations in which he finds himself. The potential for a given behavior to occur in a given situation in relation to reinforcement is a function of the expectancy of the occurrence of the reinforcement and the value of the reinforcement. The importance of expectancies is not secondary to values. It is this equal emphasis upon value, expectancy of reinforcement, and the situational specificity that makes Rotter's theory unique among learning theories which, more commonly, accentuate only the value or motive end.\textsuperscript{2}

Rotter's general formula helps to explain the place of perceived control within social learning theory.

\[ NP = f(FM \& NV) \]

The formula reads: The potentiality of occurrence of a set of behaviors that lead to the satisfaction of some need (need potential) is a function of both the expectancies that these behaviors will lead to these reinforcements (freedom of movement) and the strength or value of these reinforcements.


\textsuperscript{2}Ibid., p. 27.
The locus of control construct is derived from the term freedom of movement.

In essence, freedom of movement is a generalized expectancy of success resulting from man's ability to remember and reflect upon a lifetime of specific expectancy behavior-outcome sequences. It is not the simple registering of success and failure experiences that is relevant to the generalized expectancy of internal versus external control, but rather the interpretation of the cause of those experiences.

With the locus of control construct, we are dealing with a person as he views himself in conjunction with the things that befall him and the meaning that he makes of those interactions between his self and his experiences. Regardless of the type of experiences one has, they must be perceived as the results of one's own actions, otherwise they are not effective for altering the ways in which one sees things and consequently functions.

Rotter summarizes:

In social learning theory, a reinforcement acts to strengthen an expectancy that a particular behavior or event will be followed by the reinforcement in the future....It seems likely that,

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2 Lefcourt, Locus of Control, op. cit., p. 27.

3 Ibid., p. 29.
depending upon the individual's history of reinforcement, individuals would differ in the degree to which they attributed reinforcements to their own actions.

Expectancies generalize from a specific situation to a series of situations which are perceived as related or similar...These generalized expectancies will result in characteristic differences in behavior in a situation culturally categorized as chance versus skill determined.¹

Unless a child believes that his experiences are related to his own actions he will not learn from them.

Research has appeared which relates this personality variable to a wide range of dependent variables. Phares² has shown that internals exhibit more initiative in their efforts to control their environment and attain goals than externals did. DuCette and Wolk³ report that internals respond more readily to environmental stimuli, use experience with a task to improve performance, and are more accurate in remembering successes when feedback is provided. Internals, therefore, are more perceptive and ready to learn about their surroundings. They are more inquisitive, curious, and efficient processors of information than externals.


³DuCette and Wolk, op. cit., pp. 420-426.
In an investigation of decision-making behavior, Lefcourt, Lewis, and Silverman\(^1\) found internal subjects appeared less likely than external subjects to accept instructions stressing chance determination in a task which offered some opportunity for controllability. Internals were more ready to believe or to be influenced by directions emphasizing skill determination when there was some hope for mastery in the task. They concluded that internals would appear to be more ready to believe that task outcomes are controllable. In exploring decision-making under conditions of risk, Liverant and Scodel\(^2\) found that internals, as a function of their disbelief in luck, selected more alternatives which should occur more frequently even though the reinforcement would be less. Internals exhibited less confidence in situations where greater risk was involved. Internals appeared to be more self-reliant and to benefit from greater opportunity for control while externals appeared to defer to other's judgments and benefit from the structuring of tasks by others.

In studies concerned with reaction to social stimuli

\(^1\)Herbert M. Lefcourt, Lawrence Lewis, and Irwin W. Silverman, "Internal vs. External Control of Reinforcement and Attention in a Decision-Making Task," Journal of Personality, XXXVI (1968), 663-682.

it is suggested that internals were more resistive to subtle suggestion than externals. Strickland\(^1\) reports that internals who were aware of the response-reinforcement contingencies tended to deny the influence by the experimenter and were more resistant to extinction than externals. Getter,\(^2\) though observing no differences in the acquisition trials of a study involving verbal conditioning, reported that internals showed significantly more conditioned responses during the extinction trials. Both studies support Rotter's\(^3\) original contention that internals would be more resistive to manipulation if they were aware of the manipulation while externals, expecting control from the outside world, would be less resistive.

**Research on Locus of Control**

It seems a logical extension of the perceived locus of control dimension that internals would manifest more achievement-striving behavior than externals who feel they have little control over their environment. Any prolonged achievement effort will occur only among those individuals


who believe they can, through their own efforts, accomplish desired goals.

One of the earliest investigations with locus of control and achievement-related behavior was reported by Crandall, Katkovsky, and Preston in 1962. These investigators used a number of personality measures in predicting achievement behaviors as they were reflected in free-play activities. Subjects were forty early-grade-school-age children representing all but the lowest social class. The first form of the Intellectual Achievement Responsibility Questionnaire (IAR) was developed by Crandall et al. for this study. Dependent variables included the children's intelligence test performances, academic achievement skills, and two free-play variables: time spent in intellectual activities and intensity of striving in intellectual activities. Of the measures employed, the IAR proved the most strongly related to time spent in intellectual free play and intensity of striving for boys. The IAR was also significantly related to performance on intelligence and achievement tests for boys but not for girls.

In reporting on the strengths and limitations of the

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IAR Crandall, Katkovsky, and Crandall\(^1\) offered additional evidence of prediction to intellectual-achievement performance. The sample for this study included 923 elementary and high school students from five different schools in diverse kinds of communities. IAR scores were correlated with achievement test measures and report-card grade averages. A positive and significant correlation was obtained for grades 3, 4, and 5. In grades 6, 8, 10, and 12 achievement test scores were only occasionally related significantly to IAR scores. However, significant relationships were obtained in each of these upper grades with report-card grades. In general, the IAR has predicted best to young girls' standardized achievement-test performance and to those of older boys. It has predicted better to young boys' intellectual activities in free play. Its most consistent prediction has been to report-card grades.

McGhee and Crandall\(^2\) provide similar conclusions in another study reported in 1968. The subjects in the study were 134 third, seventh, and tenth grade children from a small central Ohio town. Grades received during the two


preceding marking periods were averaged over all academic courses for the dependent variable. While the relationships between locus of control and grade averages were not significant for females they were consistently in the expected direction. For males, the internals had significantly higher grade averages.

Messer\(^1\) reported on seventy-eight fourth-grade boys and girls in 1972. Reported results were consistently in the direction of higher grades for subjects who were more internally oriented. With scores from the Stanford Achievement Test as the dependent variable the results for boys and girls combined were in the direction of higher achievement scores for High Internals, but statistical significance was not obtained. Messer concludes that a feeling of internal control with regard to school work probably leads to greater achievement. At the same time, a child who achieves well, or who has higher intelligence, is likely to develop more readily a feeling of being in control of his own academic destiny.

In 1970 Weiner and Kukla\(^2\) reported on 385 students in grades 3, 4, 5, 6, and 10 from middle-class family


backgrounds in a suburb of Los Angeles. Their study was predicated on the assumption that individuals high in achievement motivation are likely to attribute success to internal determinants. Results indicated low, but positive correlations for males. However, only the male high school sample reached statistical significance. The conclusion reached in the study was that individuals classified as high in achievement motivation tend to attribute success in achievement-oriented situations to themselves more than individuals low in achievement motivation.

Other investigations conducted at a university level indicate similar relationships for locus of control and achievement. Wolk and DuCette reported on two studies utilizing locus of control as a moderator variable in investigating the relationship between achievement motivation and several dependent variables. The variables included preference for immediate risk, estimation of future success, and classroom test performance. Results of both studies indicate achievement-related behavior, in achievement-motivated subjects, is elicited only when these subjects possess an internal orientation.

In another study at the university level Gozali,  

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Cleary, Walster, and Gozali\(^1\) studied time utilization in reference to test-taking strategies to explore the relationship between locus of control and achievement. It was reasoned that internals would use time in a manner more appropriate to the task than would externals; that is, they would spend less time on easy items and more time on difficult ones. Subjects were 63 University of Wisconsin students. A verbal ability test, computer-administered, provided the measure of time utilization. Results supported the hypothesis that internals use time in a manner more appropriate to the test-taking situation than do externals. Because most achievement tests have a time limit good use of time is important to test performance. Differences in time utilization may explain why the sense of control variable, although unrelated to ability, is a predictor of achievement test scores.

Other researchers have not discovered significant relationships between locus of control and achievement. Prociuk and Breen\(^2\) examined the relationships between internal-external control, test anxiety constructs, and academic

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\(^2\)Terry J. Prociuk and Lawrence J. Breen, "Internal-External Control, Test Anxiety and Academic Achievement: Additional Data," *Psychological Reports*, XXXIII (1973), 563-566.
achievement. Eighty-seven subjects at the University of Manitoba were participants in the study. Reported grade-point averages were used as the measure of academic achievement. The hypothesis that internals would demonstrate academic achievement superior to that of externals was not supported.

Hjelle\(^1\) reported on 139 college males and females at the Villanova University enrolled in introductory psychology. The measure of academic achievement was the cumulative quality point average. Only marginal support was found for the prediction that internally controlled college students would obtain significantly higher quality point averages than their externally controlled counterparts.

Eisenman and Platt\(^2\) investigated birth order and sex of 131 subjects in relation to their grades as a measure of academic achievement and their perception of reinforcement as internally or externally controlled. First-born males were significantly more external, however, their external orientation could not be invoked as the explanation

\(^1\)Larry A. Hjelle, "Internal-External Control as a Determinant of Academic Achievement," Psychological Reports, XXVI (1970), 326.

for the low academic achievement of the males since there was no relationship between I-E scores and grades.

Other researchers have been concerned with the relationship of locus of control to self-esteem. In 1970, Beebe reported on a study of 200 children and adolescents in grades 4, 6, 8, and 10. The Bailer Locus of Control Scale and the Coopersmith Self Esteem Inventory were administered. A positive correlation between internality and self-concept was found for all grade levels.

Wall, in a study of 113 introductory psychology students at San Fernando Valley State College, predicted a relationship between high scores on internal control and measures of self-actualization. The Personal Orientation Inventory measuring twelve aspects of self-actualization was used in the study. Pearson product-moment correlation between the I-E scores in the internal direction and the scales of the POI yielded only three significant correlations. Wall concludes that self-actualization, as measured by the POI, is relatively independent of locus of control.

The relationship of self-concept and locus of

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2Joan D. Wall, "Relationship of Locus of Control to Self Actualization," Psychological Reports, XXVII (1970), 282.
control was also investigated by Michaels\(^1\) with a popula-
tion of educable mentally retarded and learning disabled
children. He reports no relationships between self-concept
and locus of control among the groups investigated. Handi-
capped children did, however, differ from non-handicapped
in the personality variables of self-concept and locus of
control.

Research on Open Education

Research studies comparing the effects of open and
traditional environments on academic achievement and self-
concept have not provided consistent results. At the ele-
mentary school level the administrators of the Hackensack
New Jersey Public Schools report favorable results in
achievement.\(^2\) Funded under Title III of ESEA, Project LEM
(Learning Experience Module) was an open education program
developed in 1970 for a three year experimental period.
Among the stated goals of Project LEM was the improvement
of students' reading and math skills and social competence.
Prior to the implementation of the program teachers under-
went a six-week summer workshop and ten sessions with a
psychotherapist to gain insight in working with disadvantaged,

\(^1\)C. H. Michaels. "Self-Concept and Locus of Control
in Educable Mentally Retarded and Learning Disabled,"
Dissertation Abstracts International, XXXVIII (1978), 4725A.

\(^2\)Doob, op. cit., pp. 7-8.
underachieving students. Based on the California Achievement Test scores, the researchers reported that, in each case, the test goal was surpassed. Children showed impressive gains in vocabulary, comprehension and mathematics.

Another study sponsored by the Office of Economic Opportunity\(^1\) contrasted performance contracting, an individualized instructional plan, in an open school plan with traditional school programs in eighteen selected school districts to determine the effects on student achievement. The researchers also included two "special treatment" groups—one in Grand Rapids, Iowa, and another in Hartford, Connecticut. Both "special treatment" programs were designed to improve the academic achievement of disadvantaged children. Student achievement in all groups was measured by the California, Stanford, and Metropolitan Achievement Tests. While no evidence was found to indicate performance contracting increased student achievement, comparisons of special treatment groups led to affirmative conclusions regarding the Hartford open education program. In every case a significant difference in achievement scores was found. The Hartford program proved beneficial in reading at the first grade level and mathematics at the second and third grade levels. It was equally effective when compared to the traditional school in math at the first grade level and reading

\(^1\text{Ibid., pp. 8-9.}\)
at the second and third grade levels.

Student achievement in open plan schools and conventional schools was contrasted by the Broward County School Board,¹ Fort Lauderdale, Florida. The California Test of Basic Skills was used to compare students in the third, fifth, and eighth grades. Analysis indicated that students from open schools performed best at the third grade level. Students from the conventional schools did better at the fifth and eighth grade levels.

Tuckman² matched students in grades one through five from an open classroom and a control classroom. After one year of operation he concluded that pupils did not differ in achievement or problem solving between the school environments but open classroom children exhibited more positive self appraisals and attitudes towards self than control children.

Sheirer³ studied the effects of open classroom


environments on achievement, self-concept, and student attitudes. Using one open and five traditional classrooms students were administered the Stanford Achievement Test, Childrens' Self-Concept Indicator, and Childrens' Attitudinal Range Indicator. No significant differences in academic achievement were found. Self-concept and attitude toward school were significantly less positive in the open environment. However, she qualified her conclusions by reporting that the open program had only been in operation for five months.

Reporting on the first year of a two-year study comparing the effects of open and traditional classroom instructional programs Reynolds\(^1\) indicated no significant differences between the two programs on the three student variables of self-concept, attitude toward school, and academic achievement. Approximately 250 students in grades one through six participated in the study. Measurement instruments included the Piers-Harris Self-Concept Scale, the Pictorial Self-Concept Scale, the "Faces" Inventory, and the Stanford Achievement Tests. Questionnaires administered to parents and pupils of the open classroom environment did indicate an improved attitude toward school.

Results of the second year of the study\(^1\) did not indicate any conclusions regarding the relative effectiveness of the open or traditional program. However, evidence did suggest that the open instructional program effected positive changes in the affective areas of self-concept and attitude toward school. Students in both programs performed equally well in the achievement of basic skills.

Owen\(^2\) investigated selected cognitive and affective measures at the middle school level. Subjects were 145 white, middle-class children from a rural/suburban setting in New England. The dependent measures of self-concept, creativity, locus of control, and achievement were assessed using the Piers-Harris Self-Concept Scale, Alternative Uses, Nowicki-Strickland Locus of Control Scale, and Stanford Achievement Tests. A significant difference between schools was found for the measure of creativity favoring the open educational setting. Open and traditional environments appeared to contribute equally to the development of self-concept, locus


\(^2\)Steven V. Owen et al., Effect of Open Education on Selected Cognitive and Affective Measures, U.S., Educational Resources Information Center, ERIC Document ED 093 956, April, 1974.
of control, and several cognitive areas.

A doctoral dissertation by Robert Rozar\textsuperscript{1} in 1976 compared school attitude, locus of control, and reading and mathematics achievement. Classrooms were differentiated on the basis of the Walberg-Thomas CORS as to degree of openness. Twenty fourth grade classrooms were paired for comparison. The instruments used in the study included the Pitt Study of Attitudes Scale, Crandall's IAR, and the Iowa Test of Basic Skills. No significant differences in attitude toward school or locus of control were reported. Results of all tests favored the open classroom group although not statistically significant except in mathematics concepts. Rozar concluded that there was no clearly defined advantage in the open classroom approach to education.

Franks\textsuperscript{2} compared five parochial open elementary schools and two parochial traditional schools to determine effects on student attitude toward self and learning, as well as other cognitive skills. All schools but one were inner-city schools representative of various income levels.

\textsuperscript{1}Robert Rozar, "A Comparative Study of Attitude Toward School, Intellectual Achievement Responsibility, and Achievement in Mathematics of Fourth Grade Students in Open and Traditional Classroom Instructional Programs in Selected Schools in DeKalb County, Georgia" (unpublished PhD dissertation, Georgia State University, 1976).

Schools were determined to be generally equivalent in academic quality independent of the type of program employed. No differences were found in scores on academic achievement tests but the open schools were strongly superior in attitude toward teachers and school. A statistically significant difference in the positive direction in general self esteem and school-related self esteem was found favoring the open schools.

The relationships between instructional style, school design, and selected cognitive and affective outcomes of 321 third grade children in British Columbia was investigated by Lukasevich. The Canadian Tests of Basic Skills and the Sears Self-Concept Inventory were used in this study. Schools were classified as open or non-open on the basis of the Dimensions in Schooling Questionnaire. The type of facility and instructional program appeared to be unrelated to most cognitive outcomes. However, the open space classrooms had significantly more favorable self-concept scores in relation to school subjects. In achievement, the traditional reading and mathematics groups scored significantly better than the open groups.

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1Ann Lukasevich, "A Study of Relationships Among Instructional Style (Open vs. Non-Open), Architectural Design (Open Space vs. Non-Open Space), and Measures of Self Concept and Reading and Mathematics Achievement of Third Grade Children" (unpublished PhD dissertation, University of British Columbia, 1976).
Conflicting results were reported by Wright. He compared 100 fifth grade children from traditional and open suburban elementary schools. Subjects were balanced with respect to SES, ability, and previous achievement. Differences in educational programs were evaluated using the Dimensions in Schooling Questionnaire and Flanders Interaction Analysis. Pupil scores were obtained from achievement tests, tests of creativity, and three measures of personality including self-esteem, anxiety, and locus of control. The analysis indicated significant differences on six of the nine cognitive measures. Examination of the means indicated that achievement was higher in all nine areas for the traditional school students. No significant differences were obtained for the three measures of personality or creativity.

In investigating individual characteristics and performance in open and traditional settings Soloman and Kendall report similar findings. Fifty-six boys and 36 girls with different motivational and cognitive characteristics in three open and three traditional fourth grade classrooms were evaluated on several cognitive and affective

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measures. Six significant type-of-class main effects were reported. Children in open classes scored significantly higher on creativity, democratic, cooperative behavior, and involvement in class activities. They were significantly lower on achievement test performance, undisciplined activity, and social involvement.

Studies of non-cognitive aspects of open education also yield conflicting results. Heimgartner\(^1\) compared the self-concept of 212 children from the lab school at the University of Northern Colorado in an open environment and a control group from self-contained classrooms. Measures of self-concept were obtained from the Self-Social Symbols Tasks and the Children's Self-Social Constructs Tests. Students in the lab school open environment exhibited an increase in self esteem over the traditional classrooms.

Wilson, Stuckey, and Langevin\(^2\) compared pupils from two open plan philosophies to two traditional schools. Attitudes towards school, teacher, self, learning, and "school last year" were assessed using a semantic differential. Pupils were also compared on measures of curiosity and

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productive thinking. Open pupils were found to have more positive attitudes toward school and themselves but no differences were found for the other areas. Differences favoring the open school were also found in the area of productive thinking.

Kohler\(^1\) compared 316 students ages 9 to 12 from six suburban schools. School openness was determined from scores on the Walberg-Thomas CORS. No significant differences in the six areas of self-concept measured were reported but there occurred a significant difference in total self-concept between males in open and traditional schools and males and females in open schools. Kohler concludes that males in open schools show more positive self-concepts.

Purkey, Graves, and Zellner\(^2\) explored the effects of a team teaching approach on 414 pupils in an open environment and 525 pupils in a non-open environment in relation to self-concept. Significant differences between the groups were reported. Their findings suggest that as grade level increases differences in self-concept increase. Pupils in open environments evidenced relative stability in


self-concept up to grade five and then showed a marked increase. Pupils in non-open environments showed a steady decrease in self-concept until fifth grade where scores stabilized.

Ruedi and West\(^1\) compared self-concept in the open and traditional school with 24 children using Gordon's How I See Myself Scale. Subjects were fourth, fifth, and sixth grade children. The idea that students in the open environment school would be higher in self-concept was not supported. The factor Teacher-School was shown to be significantly higher in open environment students indicating these students find school a friendly environment in which they can do things of interest and succeed.

Self-concept between open and traditional classrooms was also investigated by Trinka.\(^2\) The subjects for the study were 103 fifth-grade students. Subjects were divided into categories according to SES and IQ. No significant difference was reported between traditional schools and open schools. However, further analysis did show that children from areas of high socioeconomic status benefit more from the

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open environment.

In a study comparing non-cognitive outcomes and teacher/child behaviors in schools of open and traditional designs Seefeldt\(^1\) noted few differences in outcomes. Sixty classes from ten traditional and ten open schools served as the sample. Creativity, self-concept, school morale, and social structure were measured. School morale was higher for children in open classrooms and more social work and child/child interactions were observed. Traditional classrooms were higher in creativity.

**Locus of Control and Instructional Style**

Kocher\(^2\) compared the locus of control of students in both open and traditional classrooms. The subjects for this study were enrolled in the Minneapolis Public Schools. One classroom had just begun an open program, one had been in operation for one year, and one was selected as representative of a traditional classroom. The Minneapolis system has developed a system of educational alternatives whereby

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\(^1\)Carol Seefeldt, "A Description and Comparison of Non-Cognitive Outcomes in Classrooms of Open Space and Traditional Design" (paper presented at the annual meeting of the American Educational Research Association, New York, April, 1977).

\(^2\)A. Thel Kocher, "A Comparison of Locus of Control in Open and Traditional Elementary Programs" (paper presented at the annual meeting of the American Educational Research Association, New York, April, 1977).
students and parents are able to select their type of instructional classroom. Subjects were administered Crandall's IAR which provides a score indicating responsibility for success (I+) and a score indicating responsibility for failure (I-). The lack of significant group main effects indicated that students in the open programs did not acquire a greater sense of internal control for achievement successes or failures than students in a traditional program.

The interactive effects of achievement orientation and teaching style on academic achievement was studied by Domino. One hundred introductory psychology students were assigned to one of four class sections taught in either a "conforming" or "independent" manner according to their achievement orientation. Achievement measures included a final examination and six essay questions which demanded both convergent and divergent thinking. Significant interaction effects between achievement orientation and teaching style were reported. Students taught in a manner consonant with their achievement orientation obtained higher means on the multiple-choice items, on factual knowledge of their essay answers, and on their ratings of teacher effectiveness and course evaluation.

Stone used the Nowicki-Strickland Locus of Control Scale with 200 seventh grade students in open and traditional classrooms in Rhode Island to explore relationships between locus of control and classroom environment. Results of the study indicated a significant correlation between locus of control and achievement as measured by the Iowa Test of Basic Skills. Stone concludes that the open classroom provides a learning environment which will positively affect internal locus of control by producing a higher degree of internality than a traditional classroom.

A correlation of locus of control and nine achievement measures was investigated by Wright and DuCette. Matched samples of fifth grade students representing open and traditional settings were used in the study. Locus of control was measured by Crandall's IAR and achievement was measured by the Stanford Achievement Test. Correlations indicated that locus of control was able to predict achievement only in the open setting.

A second study was conducted on the community


2Robert J. Wright and Joseph DuCette, "Locus of Control and Academic Achievement in Traditional and Non-Traditional Educational Settings" (paper presented at the annual meeting of the American Educational Research Association, New York, April, 1977).

3Ibid.
college level. Alternative sections of psychology classes were offered. While there was no precise definition of the alternative sections they were required to follow an "open format." Results from this study were in basic agreement with the previous study. The IAR was able to predict achievement more strongly in the alternative setting.

Arlin reports on the interaction of locus of control and classroom style in a study of 660 pupils in open and traditional classrooms, grades four, six, and eight, in North Carolina. Instruments used in the study included the IAR and two student attitude questionnaires. Internals were more satisfied in open, low-structured environments with the trend more pronounced for males than females. Internal males did better in open environments and possessed more positive attitudes toward school.

The relationship between personal locus of control, teaching discipline, student performance, and satisfaction was studied by Parent, Forward, Canter, and Mohling. Fifty-four college students were premeasured on the Internal-External Scale and randomly assigned to two teaching

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2 Joseph Parent, John Forward, Rachell Canter, and Judith Mohling, "Interactive Effects of Teaching Strategy and Personal Locus of Control on Student Performance and Satisfaction," Journal of Educational Psychology, LXVII, No. 6 (1975), 764-769.
conditions. In the high-discipline condition, students completed a two-hour mini-course on computer programming. In the low-discipline condition students were given the same materials but were to proceed at their own pace. Significant differences between conditions on all the discipline dimensions were observed. Students high in internal control performed better under conditions of low-discipline and students of external control performed better under conditions of high-discipline. Students assigned to their preferred discipline condition showed greater satisfaction.

In another study on the college level conducted by Daniels and Stevens, 146 psychology students were assigned to a traditional learning (teacher controlled) group or a self-directed (contract plan) learning group. Students were administered the Internal-External Locus of Control Scale. The dependent variable was a 75 item multiple-choice pretest-posttest. Analysis of covariance showed no significance in main effects but did show a significant interaction effect with internals performing better under the contract plan and externals performing better under the teacher controlled method.

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Judd\textsuperscript{1} also studied the relationship of locus of control to student attitude in the open school environment. The subjects were 141 sixth grade students in three open environments and 174 sixth grade students in three traditional environments. Results of this study indicate that internal students possess more positive attitudes toward school and themselves as learners in the open setting while students with external locus of control exhibit more positive attitudes in the traditional setting.

In summary, the open educational philosophy is not a recent development but has antecedents dating back to the Greek philosophers. Its most recent impetus was in the early twentieth century following the writings of Dewey and later in the 1970s following the criticism of educational writers. The British Informal School has had much influence upon the development of the American model. Open education centers around beliefs about children and learning.

The open educational movement has been concerned with the humanistic aims of education and the development of the child's self-concept. Modern writers reiterate the need of the school to concern itself with feeling and valuing. The school is seen as an important influence in

\textsuperscript{1}David Judd, "The Relationship of Locus of Control as a Personality Variable to Student Attitude in the Open School Environment," Dissertation Abstracts International, XXXV (1974), 3522A.
helping children to develop their self-concept.

The locus of control personality construct, developed by Rotter, measures the extent to which a person believes he can control his destiny. Internals believe that their own actions are related to their reinforcements while externals believe that reinforcements are unrelated to actions and result from chance, luck, or the control of others. Research relating to this variable has been reported in the areas of personality, attempts to control the environment, risk-taking, reaction to social stimuli, achievement, anxiety, and learning.

In studies dealing with locus of control and academic achievement researchers report a predictive ability concerning academic performance. Internals possess a greater degree of achievement related behavior than externals. However, this relationship is not as strongly supported at the university level. A positive correlation has also been found for self-concept and internality.

Research on open education reports conflicting results. Studies concerning academic achievement and self-concept have been reviewed in this chapter which favor both the open and the traditional classrooms. In many of these studies, however, open schools and traditional schools have been identified only through architectural design rather than instructional program.

Researchers have also studied the interaction of
locus of control and instructional style. Generally, the results have indicated that internals experienced greater success in less structured situations while externals experienced greater success in structured environments. Additional research is needed to clarify these conflicting results.
Chapter 3

METHODS AND PROCEDURES

The methods and procedures utilized in the present study are discussed in this chapter. The following sections are included: (1) scope, (2) instruments, (3) sample selection, and (4) data analysis procedures.

Scope

This research study was devised to investigate the effects of open and non-open classroom environments and internal-external locus of control on student achievement and self-concept. The achievement measures were the Iowa Test of Basic Skills Form 5 subscores of reading achievement, mathematics achievement, and composite achievement. The locus of control measure was the Children's Nowicki-Strickland Internal-External Scale. The measure of self-concept was the Coopersmith Self-Esteem Inventory. The study was conducted during the 1977-78 school year.

Instruments

Dimensions of Schooling Questionnaire Form VI

The Dimensions of Schooling (DISC VI) questionnaire was developed by Ross E. Traub, Joel Weiss, C. W. Fisher,
and Don Musella\textsuperscript{1} for the Ontario Institute for Studies in Education (OISE) in 1972. The DISC VI was developed for assessing the extent to which a school's program embodies the characteristics of open education.

The questionnaire is composed of 32 items. All of the items of the DISC VI are similar in format: the dimension or aspect of school or classroom life that forms the focus of the item is defined briefly, and is followed by a set of alternatives constructed along a continuum from most "open" to least "open." The majority of items contain either four or five alternatives.

Each item is classified as to whether it is related to a general dimension of the school or a specific dimension of the teacher's class or situation. The first items are concerned with describing dimensions that cut across all teaching and learning situations in the school and include: Assignment of Students to Teachers, Time Structure, Unstructured Time, Rule-Making, and Rule-Enforcing. The remaining items are involved with specific aspects of each different subject-matter area that a teacher has responsibility for: science, mathematics, social studies, reading, and language arts. Information is collected about the different subject areas because it is likely that different curricular areas

\textsuperscript{1}Ross E. Traub, Joel Weiss, C. W. Fisher, and Don Musella, "Closure on Openness: Describing and Quantifying Open Education," \textit{Interchange}, III, Nos. 2-3 (1972), 69-84.
lend themselves to different conditions and practices. Thus, subject-matter areas ordinarily thought of as highly structured, such as mathematics or reading, may be treated very differently than those considered less structured, e.g., social studies.

Validity procedures included item scrutiny by a team of educational workers representing backgrounds in sociology, psychology, test construction, administration, organizational theory, and classroom teaching. Empirical validation was conducted in exemplar open and traditional schools in Metropolitan Toronto. The mean score on the DISC I obtained by the teachers from each school were 20.18 for open schools and 11.27 for traditional schools with standard deviations of 1.30 for the open schools and 2.17 for the traditional schools. Subsequent revisions of the DISC and use with 449 teachers in 30 schools yielded a mean of 10.37 with a standard deviation of 2.24.

Estimates of reliability were obtained by calculating coefficient alpha, an internal consistency estimate. The reliability coefficient for all teachers was .81. For teachers from open architectural and traditional architectural schools, the estimates were .87 and .79 respectively.

The completed questionnaires were scored by this researcher to see if the instructional program could be classified as open or non-open. The scoring of the DISC VI is such that the higher the score obtained the greater is
the extent to which the classroom program reflects practices of open education. The scoring of the items is based on a limited ranking procedure with one set of weights for options and one set of weights for the assigned ranks, yielding a score for each item in the interval 0-1. The individual item scores are then summed over the 32 items yielding an index of program openness in the interval 0-32.

In this study the open programs generally scored higher on the following program characteristics: setting instructional objectives, materials and activities, role of the teacher, student evaluation, student control, time scheduling, and individualization of instruction. Non-open programs tended to score low on these characteristics.

Children's Nowicki-Strickland Internal-External Control Scale

The Children's Nowicki-Strickland Internal-External Control Scale was developed by Nowicki and Strickland\(^1\) in order to assess a generalized locus of control orientation for children. Originally, it was labelled as the Nowicki-Strickland Locus of Control Scale for Children. However, Nowicki and Duke called it the Children's Nowicki-Strickland Internal-External Control Scale (CNS-IE) to emphasize the fact that the scale aims at measuring children's generalized

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beliefs in internal-external control.

The CNS-IE provides only one score, the I-E score. A high score on the scale indicates external control while a low score represents internal control. According to Nowicki and Strickland's report, the test-retest reliability of the scale is .71 for the tenth grade; the construct validity coefficient, obtained by correlating the CNS-IE to the I-subscale of the Crandall's IAR is .51 for the seventh grade; the correlations between the CNS-IE and achievement test scores are -.44 for boys and -.03 for girls in the tenth grade. Although the Bialer-Cromwell as well as the Battle and Rotter scale is comparable with the CNS-IE scale in the sense that they purport to assess children's beliefs in internal-external control of reinforcement generalized across a variety of situations, this study utilized the CNS-IE scale as a general-global measure of locus of control because of its satisfactorily established reliability and validity.

Coopersmith Self-Esteem Inventory

The Coopersmith Self-Esteem Inventory (SEI) was devised by Stanley Coopersmith\(^1\) to assess a person's subjective judgment or evaluation of his personal worthiness that is expressed in the attitudes toward himself in various

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situations. The inventory consists of 58 statements, each of which asks an individual to answer whether or not the statement describes his usual feeling in a given situation by putting a check in the column labelled "Like Me" or "Unlike Me." A high score on the SEI represents positive global self-esteem, while a low score indicates negative self-esteem. Eight of the 58 items in the SEI are not included in the score for assessing a child's level of self-esteem because they are items for detecting the degree of socially desirable responses made by a child on the inventory. In this study tests were discarded which showed lie scores of one, two, or three as directed by Coopersmith. The lie items should be answered "not like me" so a score of eight indicates truthfulness and a score of one indicates untruthfulness.

The scale was used with 1,748 children in the public schools of Central Connecticut. For these children the mean for boys was 70.1, the standard deviation 13.8, and for girls the mean was 72.2, the standard deviation 12.8. Test-retest reliability after five weeks was found to be .88 and after a three-year interval .70. Validity was established by high correlation with teachers' predictions of children's self-esteem, and correlations with creativity, anxiety, parental treatment, levels of aspirations and other variables.
The Iowa Test of Basic Skills, Form 5 was prepared under the direction of A. N. Hieronymous and E. F. Lindquist at the University of Iowa. The Iowa Test of Basic Skills is an achievement test battery that is concerned with generalized intellectual skills and abilities. Emphasis has been on functional values and the ability of the student to use skills. The skills measured by the Iowa Test of Basic Skills are classified into five major areas: vocabulary, reading, language, work-study, and mathematics. For this study reading and mathematics achievement, as well as the composite achievement score, were selected for analysis.

Principles of validation of test content have been applied in the preparation of individual test items. The content of the test was determined through a systematic consideration of courses of study, statements of authorities in method, and recommendations of national curriculum groups. The content of the test has been very carefully selected to represent curriculum practices and to reflect current emphasis upon social utility and relevance for a diverse population.

Equivalent forms reliability data obtained from an
Iowa study yielded reliability coefficients for sixth grade reading achievement of .83; for mathematics achievement of .85; and for composite achievement of .97.

Percentile ranks based upon Iowa norms are utilized by the district selected for this study and were used in the analysis of the data.

Sample Selection

This study was conducted in an independent suburban school district near a midwestern metropolitan area. The population for the study consisted of 125 students enrolled in the sixth grade of six selected classrooms during the 1977-78 school year. The classrooms selected for the study were determined by the use of the Dimensions of Schooling (DISC VI) questionnaire.

All available upper elementary classroom teachers in the selected district were asked to respond to the questionnaire. From a total possible population of 15 classroom teachers, ten teachers or 67 percent responded.

The mean score for the three non-open classrooms selected for this study was 11.834 and the mean score for the three open classrooms was 17.260. The mean for all ten teachers completing the questionnaire was 14.299. Table 1 contains the individual scores obtained by the ten teachers who responded to the DISC VI questionnaire. The lowest three scores comprised the non-open classroom sample while
the highest three scores provided the open classroom sample. Selected classrooms yielded a student sample size of 66 for open classroom environments and a sample size of 59 for non-open classroom environments.

Table 1

<table>
<thead>
<tr>
<th>School</th>
<th>Teacher</th>
<th>DISC VI Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>11.205</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>12.457</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>11.840</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>12.965</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>12.837</td>
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<tr>
<td></td>
<td>2</td>
<td>14.203</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>14.810</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>14.816</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>15.890</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>21.075</td>
</tr>
</tbody>
</table>

Upon identification of the classrooms for inclusion in this study, the students were administered the Children's Nowicki-Strickland Internal-External Control Scale and the Coopersmith Self-Esteem Inventory. Academic achievement scores on the Iowa Test of Basic Skills Form 5 subtests for reading, mathematics, and composite achievement were
obtained from school records.

Data Analysis Procedures

Analysis of covariance statistical procedures were utilized to test the first three research hypotheses. Analysis of variance statistical procedures were used to test the fourth research hypothesis. Since analysis of covariance is an extension of analysis of variance, the former will be examined in more detail. The data for this study were analyzed on a CYBER 75 computer. The programs used were those available through the Statistical Package for the Social Sciences (SPSS) system.¹

Analysis of covariance procedures were utilized in this study because it was necessary to study pre-existing classrooms. The students in this experiment could not be matched or randomly assigned to classroom environments. Analysis of covariance is a form of analysis of variance that tests the significance of the differences between means of final experimental data by taking into account the correlation between the dependent variable and one or more covariates, and by adjusting initial mean differences in the experimental groups.² Student IQ was the covariate utilized.


for this analysis since IQ is known to exert a powerful influence on student academic achievement. By means of regression analysis, the effect of student IQ was statistically controlled so that the analysis of the intergroup comparisons of the criterion measures was not confounded by this concomitant variable.

Analysis of covariance procedures for studies of this type are appropriate according to Lindquist since through a purely statistical control we can secure the same precision in the evaluation of the treatment effect as if we had experimentally controlled the X-factor by actually matching the groups with reference to X, or by constituting the subjects into levels on the basis of X and using the appropriate test in a treatments x levels design.¹ This procedure is an extension of the analysis of variance where the dependent variable is the adjusted, rather than actual, score on the criterion measure.

The analysis of covariance model may be stated as:

\[ Y_{jhi} = \mu + \alpha_j + \gamma_h + (\alpha\gamma)_{jh} + \beta(X_{jhi} - M_x) + \varepsilon_{jhi} \]

where

\[ Y_{jhi} = \text{Criterion measure score for subject } i \text{ in research combination } A_jB_h \text{ (} A_j \text{ and } B_h \text{ represent classroom climate level } j \text{ and locus of control level } h \text{ respectively).} \]

\[ X_{jhi} = \text{IQ score for subject } i \text{ in research combination } A_j B_h. \]

\[ M_X = \text{Average IQ score of experimental subjects.} \]

\[ \mu = \text{Mean criterion measure score attributed to the population comprised of research combination subpopulations.} \]

\[ \alpha_j = \text{Effect of classroom climate } (A_j). \]

\[ \gamma_h = \text{Effect of locus of control } (B_h). \]

\[ (\alpha \gamma)_{jh} = \text{Interaction effect for research combination } A_j B_h. \]

\[ \beta = \text{The linear regression coefficient for } X. \]

\[ \epsilon_{jhi} = \text{Residual error.} \]

Several assumptions must necessarily be met if the analysis of covariance model is appropriate for analysis of the data in this study. These are summarized from Lindquist\(^1\) as follows:

1. The subjects in each group were originally drawn randomly from the same parent population.

2. The concomitant variable (IQ) was unaffected by the independent variables (classroom climate and locus of control).

3. The criterion measures for each treatment group were a random sample from those for a corresponding treatment population.

\(^1\)Ibid., p. 323.
4. The regression of the criterion measures reading, mathematics, and composite scores on IQ is the same for all research populations.

5. The regression of the criterion measures reading, mathematics, and composite scores on IQ is linear for all research group populations.

6. The distribution of adjusted scores for each research group is normal.

7. These research populations of adjusted scores have equal variances.

The preceding conditions were assumed to be tenable for the following reasons.

The school district utilized in this study was predominantly middle class suburban and homogeneous in nature. Consequently, the students attending the selected schools represented a uniform cross-section of the district. The IQ measures were determined prior to the beginning of the school year. This experimental procedure insured that they were not affected by the independent variables for this study. Visual inspection of the scatterplots of the residual criterion measure scores indicated that the linearity and homoscedasticity are reasonable assumptions for this data. Additionally, the computation of the Bartlett-Box F statistic on unadjusted criterion measure scores resulted in F values between .034 and .323. These values indicated homogeneity of variances of these scores. The trends exhibited by the
adjusted scores for each group also supported the assumptions of normality. Lastly, Lindquist also states:
"Linearity of regression, normality of distribution and homogeneity of variance must generally represent judgments based on a priori considerations since available statistical tests of the validity of these assumptions are both low in power and difficult to apply."¹ For this study the a priori considerations discussed do substantiate the appropriateness of the use of the analysis of covariance model.

This study employed a factorial design with unequal cell frequencies to test the main hypotheses. A fixed effect model using the classical experimental design approach for assigning proportions of sum of squares (SS) as discussed by Kim and Kohout² was utilized. In this approach the appropriate F ratio for testing the significance of each component is

\[ F = \frac{SS \ for \ each \ component/df_1}{SS \ error/df_2} \]

where

\[ df_1 = \text{the degrees of freedom of component under study} \]
\[ df_2 = 120. \]

¹Ibid., p. 330.

This analysis of covariance procedure for such a design is relatively straightforward however, if the frequencies in each cell are not equal but are proportional to the marginal frequencies of the factors only the main effects are still orthogonal. The interaction effects are generally not independent of the main effects. Similarly when cell frequencies are not proportional to the marginal frequencies for each factor the main factor effects may not be orthogonal. Consequently, the main additive effect as a whole may be significant while neither of the individual main effects is significant. This occurs because each factor receives credit only for the incremental SS that it adds to the effects of the other factor.

The two-way analysis of covariance procedures were chosen due to this researchers interest in examining the possible effects of both locus of control and school environment on measures of student achievement and self-concept. The literature cited in Chapter 2 has indicated conflicting results when studying these main effects separately. These results may have been due to interaction effects between the two researched variables and thus may be more appropriately examined when combined in an analysis of covariance design.
Chapter 4

ANALYSIS OF THE DATA

Introduction

This study investigated the relationships between open and non-open educational settings and internal-external locus of control. These relationships were examined with respect to academic achievement and student self-concept. This chapter provides an analysis of the data collected for testing the hypotheses that formed the basis of the study. It is divided into the following sections: (1) descriptive statistics for the aptitude and criterion measures, and (2) testing the research hypotheses.

Descriptive Statistics for the Aptitude and Criterion Measures

For this study sample size, means, and standard deviations for all variables were computed. In Tables 2 through 5 the data for the criterion measures (reading, mathematics, and composite achievement scores and self-concept scores) are presented for the classroom environments and the locus of control independent variables. The percentile range of the reading Iowa Test of Basic Skills scores was 1 to 99; the range of the mathematics Iowa Test of Basic Skills scores was 1 to 99; the range of the composite achievement Iowa Test of Basic Skills scores was
Table 2
Table of Means and Standard Deviations for Reading Achievement Scores and IQ Covariate

<table>
<thead>
<tr>
<th></th>
<th>Internal Locus of Control</th>
<th>External Locus of Control</th>
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<tbody>
<tr>
<td></td>
<td>n</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>TQ</td>
<td>109.30</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>11.69</td>
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<tr>
<td>Open School</td>
<td>Read</td>
<td>50.94</td>
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<td></td>
<td>SD</td>
<td>25.70</td>
</tr>
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<td>n</td>
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<tr>
<td></td>
<td>TQ</td>
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<td>Non-Open School</td>
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<td></td>
<td>SD</td>
<td>13.89</td>
</tr>
<tr>
<td></td>
<td>Read</td>
<td>56.06</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>24.69</td>
</tr>
</tbody>
</table>
Table 3
Table of Means and Standard Deviations for Mathematics Achievement Scores and IQ Covariate

<table>
<thead>
<tr>
<th></th>
<th>Internal Locus of Control</th>
<th>External Locus of Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Open School</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>IQ</td>
<td>109.30</td>
<td>107.52</td>
</tr>
<tr>
<td>SD</td>
<td>11.69</td>
<td>14.85</td>
</tr>
<tr>
<td>Math</td>
<td>50.27</td>
<td>40.30</td>
</tr>
<tr>
<td>SD</td>
<td>25.48</td>
<td>24.56</td>
</tr>
<tr>
<td><strong>Non-Open School</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td>IQ</td>
<td>110.90</td>
<td>110.73</td>
</tr>
<tr>
<td>SD</td>
<td>16.20</td>
<td>12.94</td>
</tr>
<tr>
<td>Math</td>
<td>57.07</td>
<td>52.73</td>
</tr>
<tr>
<td>SD</td>
<td>28.39</td>
<td>28.21</td>
</tr>
<tr>
<td><strong>Open School</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>62</td>
<td>63</td>
</tr>
<tr>
<td>IQ</td>
<td>110.05</td>
<td>109.05</td>
</tr>
<tr>
<td>SD</td>
<td>13.89</td>
<td>13.95</td>
</tr>
<tr>
<td>Math</td>
<td>53.45</td>
<td>46.22</td>
</tr>
<tr>
<td>SD</td>
<td>26.88</td>
<td>26.88</td>
</tr>
</tbody>
</table>
Table 4

Table of Means and Standard Deviations for Composite Achievement Scores and IQ Covariate

<table>
<thead>
<tr>
<th></th>
<th>Internal Locus of Control</th>
<th>External Locus of Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Open School</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>(\bar{IQ})</td>
<td>109.30</td>
<td>107.52</td>
</tr>
<tr>
<td>SD</td>
<td>11.69</td>
<td>14.85</td>
</tr>
<tr>
<td>Comp</td>
<td>56.85</td>
<td>48.03</td>
</tr>
<tr>
<td>SD</td>
<td>23.88</td>
<td>23.09</td>
</tr>
<tr>
<td><strong>Non-Open School</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td>(\bar{IQ})</td>
<td>110.90</td>
<td>110.73</td>
</tr>
<tr>
<td>SD</td>
<td>16.20</td>
<td>12.94</td>
</tr>
<tr>
<td>Comp</td>
<td>62.66</td>
<td>55.50</td>
</tr>
<tr>
<td>SD</td>
<td>24.31</td>
<td>24.27</td>
</tr>
</tbody>
</table>

n = number of subjects
\(\bar{IQ}\) = mean IQ
SD = standard deviation
Comp = composite achievement score

Table 5
Table of Means and Standard Deviations for Self-Concept Scores

<table>
<thead>
<tr>
<th></th>
<th>Internal Locus of Control</th>
<th>External Locus of Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open School</td>
<td>n 33</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>SC 69.82</td>
<td>59.52</td>
</tr>
<tr>
<td></td>
<td>SD 14.60</td>
<td>13.81</td>
</tr>
<tr>
<td>Non-Open School</td>
<td>n 29</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>SC 68.55</td>
<td>56.60</td>
</tr>
<tr>
<td></td>
<td>SD 14.95</td>
<td>15.47</td>
</tr>
<tr>
<td></td>
<td>n 62</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>SC 69.23</td>
<td>57.65</td>
</tr>
<tr>
<td></td>
<td>SD 14.65</td>
<td>14.64</td>
</tr>
</tbody>
</table>
3 to 99; and the range of the Coopersmith Self-Esteem Inventory scores was 24 to 98. The standard deviations in all tables indicate highly similar variability for all environments and levels of locus of control.

Pearson product moment correlations were run between the independent variables (classroom environment and locus of control), the dependent variables (reading, mathematics, composite achievement, and self-concept), and the concomitant variable (IQ). Table 6 presents the results of these computations. The concomitant variable IQ was highly correlated with all criterion measures. It was also highly correlated with the independent measure classroom environment but not with the independent measure locus of control. The two independent variables were not significantly correlated.

Testing the Research Hypotheses

The present study focused upon four major research hypotheses. Analysis of covariance procedures were utilized to study the effects of two classroom climates and students' locus of control on school achievement in reading, mathematics, and composite scores on the Iowa Test of Basic Skills. In these analyses IQ was used as the concomitant variable. Analysis of variance procedures were utilized to assess the effects of two classroom climates and students' locus of control on student self-concept. Analyses of these
### Table 6

**Correlation Coefficients with all Variables**

<table>
<thead>
<tr>
<th></th>
<th>IQ</th>
<th>Sch</th>
<th>LOC</th>
<th>Read</th>
<th>Math</th>
<th>Comp</th>
<th>SC</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ</td>
<td>1.000</td>
<td>-.0869</td>
<td>-.1647</td>
<td>.6860</td>
<td>.7259</td>
<td>.7999</td>
<td>.1757</td>
</tr>
<tr>
<td></td>
<td>.168</td>
<td>.033</td>
<td>.001</td>
<td>.001</td>
<td>.001</td>
<td>.025</td>
<td></td>
</tr>
<tr>
<td>School</td>
<td>1.000</td>
<td>.0568</td>
<td>-.1786</td>
<td>-.1777</td>
<td>-.1365</td>
<td>.0826</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.256</td>
<td>.023</td>
<td>.024</td>
<td>.065</td>
<td>.170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locus</td>
<td>1.000</td>
<td>-.3021</td>
<td>-.1698</td>
<td>-.2209</td>
<td>-.4815</td>
<td></td>
<td></td>
</tr>
<tr>
<td>of</td>
<td></td>
<td>.001</td>
<td>.029</td>
<td>.007</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td>1.000</td>
<td>.6332</td>
<td>.8511</td>
<td>.2004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.001</td>
<td>.001</td>
<td>.013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td>1.000</td>
<td>.8547</td>
<td>.2106</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.001</td>
<td>.029</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite</td>
<td>1.000</td>
<td>.1703</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.029</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Concept</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
four main hypotheses follow.

Research hypothesis 1: There is no mean difference in reading achievement, adjusted for IQ effects, between internal and external students in open and non-open school environments.

This hypothesis was tested by examining the three following hypotheses.

Hypothesis 1a: There is no mean difference in reading achievement, after adjusting for IQ, in open and non-open classroom environments.

Hypothesis 1b: There is no mean difference in reading achievement, after adjusting for IQ, between internals and externals.

Hypothesis 1c: There is no mean difference in reading achievement, after adjusting for IQ, due to the interaction of classroom climates and locus of control.

The statistics utilized to test hypothesis 1 are presented in Tables 7 and 8. Table 7 contains the adjusted means of the scores pertinent to this hypothesis. Table 8 is the analysis of covariance summary table. As can be seen from Table 8 the F value of 1.038 for interaction effects was not significant. However, the F value of 7.597 for the main effects additive model was significant at the .001 level. Consequently, the significance of each main effect was examined. This analysis revealed a main effects F value of 3.323 for classroom climate. This F value was not
### Table 7

Adjusted Means for Reading Achievement by Classroom Climate and Locus of Control

<table>
<thead>
<tr>
<th>Group</th>
<th>Reading Means Adjusted for Covariates and Independents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>47.49</td>
</tr>
<tr>
<td>Non-Open</td>
<td>53.45</td>
</tr>
<tr>
<td>Internal</td>
<td>55.49</td>
</tr>
<tr>
<td>External</td>
<td>45.19</td>
</tr>
</tbody>
</table>

### Table 8

Analysis of Covariance Summary Table for Reading Achievement by Open and Non-Open Classroom Climates and Internal-External Locus of Control

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects</td>
<td>2</td>
<td>4367.783</td>
<td>2183.892</td>
<td>7.597</td>
<td>.001</td>
</tr>
<tr>
<td>School</td>
<td>1</td>
<td>1098.999</td>
<td>1098.999</td>
<td>3.823</td>
<td>.053</td>
</tr>
<tr>
<td>LOC</td>
<td>1</td>
<td>3312.682</td>
<td>3312.682</td>
<td>11.524</td>
<td>.001</td>
</tr>
<tr>
<td>Interactions</td>
<td>1</td>
<td>298.491</td>
<td>298.421</td>
<td>1.038</td>
<td>.310</td>
</tr>
<tr>
<td>Residual</td>
<td>120</td>
<td>34494.176</td>
<td>287.451</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
significant. The main effects F value of 11.524 for locus of control was significant at the .001 level. Internal students scored significantly better on the reading subtest of the Iowa Test of Basic Skills than did external students.

Hypothesis 1b was subsequently rejected at the .05 level of significance whereas hypotheses 1a and 1c were retained.

Research hypothesis 2: There is no mean difference in mathematics achievement, adjusted for IQ effects, between internal and external students in open and non-open school environments.

This hypothesis was tested by examining the three following related hypotheses.

Hypothesis 2a: There is no mean difference in mathematics achievement, after adjusting for IQ, in open and non-open classroom environments.

Hypothesis 2b: There is no mean difference in mathematics achievement, after adjusting for IQ, between internals and externals.

Hypothesis 2c: There is no mean difference in mathematics achievement, after adjusting for IQ, due to the interaction of classroom climates and locus of control.

The statistics utilized to test hypothesis 2 are presented in Tables 9 and 10. Table 9 contains the adjusted means of the scores pertinent to this hypothesis. Table 10 is the analysis of covariance summary table. From
Table 9
Adjusted Means for Mathematics Achievement by Classroom Climate and Locus of Control

<table>
<thead>
<tr>
<th>Group</th>
<th>Mathematics Means Adjusted for Covariates and Independents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>46.84</td>
</tr>
<tr>
<td>Non-Open</td>
<td>53.13</td>
</tr>
<tr>
<td>Internal</td>
<td>52.78</td>
</tr>
<tr>
<td>External</td>
<td>46.89</td>
</tr>
</tbody>
</table>

Table 10
Analysis of Covariance Summary Table for Mathematics Achievement by Open and Non-Open Classroom Climates and Internal-External Locus of Control

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects</td>
<td>2</td>
<td>2282.304</td>
<td>1141.152</td>
<td>3.386</td>
<td>.037</td>
</tr>
<tr>
<td>School</td>
<td>1</td>
<td>1224.408</td>
<td>1224.408</td>
<td>3.633</td>
<td>.059</td>
</tr>
<tr>
<td>LOC</td>
<td>1</td>
<td>1084.456</td>
<td>1084.456</td>
<td>3.218</td>
<td>.075</td>
</tr>
<tr>
<td>Interactions</td>
<td>1</td>
<td>89.145</td>
<td>89.145</td>
<td>.265</td>
<td>.608</td>
</tr>
<tr>
<td>Residual</td>
<td>120</td>
<td>40441.490</td>
<td>337.012</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
the data in Table 10 it can be seen that the F value for interaction of .265 did not reach significance. The main effects additive model F value of 3.386 was significant at the .037 level. However, neither of the main effects F value of 3.633 for classroom climate nor the F value of 3.218 for locus of control were significant at the .05 level. This results because the cell frequencies of each factor are not proportional to the marginal frequencies of the factors. Thus there is some association between classroom climate and locus of control causing the additive effect as a whole to be significant for the criterion measure mathematics while neither of the individual main effects is significant. This occurs because classroom climate and locus of control receive credit only for the incremental sum of squares (SS) that each adds to the effects of the other factor. As can be seen from Table 10 the individual effects SS of classroom climate and SS of locus of control exceed the additive main effects SS.

For this major research question the overall hypotheses may be rejected while hypotheses 2a, 2b, and 2c must be retained since the exact location of the significant main effect could not be determined. This hypothesis should be considered in a design with equal cell frequencies to ascertain the exact cause of the significant overall main effect.

Research hypothesis 3: There is no mean difference in the composite achievement scores, adjusted for IQ effects.
between internal and external students in open and non-open school environments.

This hypothesis was tested by examining the three following related hypotheses.

Hypothesis 3a: There is no mean difference in the composite achievement scores, after adjusting for IQ, in open and non-open classroom environments.

Hypothesis 3b: There is no mean difference in the composite achievement scores, after adjusting for IQ, between internals and externals.

Hypothesis 3c: There is no mean difference in the composite achievement scores, after adjusting for IQ, due to the interaction of classroom climates and locus of control.

The statistics utilized to test hypothesis 3 are presented in Tables 11 and 12. Table 11 contains the adjusted means of the scores pertinent to this hypothesis. From Table 12 the F value of .012 for interaction was not significant. The F value of 4.188 for the main effects additive model was significant at the .017 level. Examination of the main effects revealed an F value of 1.691 for classroom climate which was not significant. However, the F value of 6.762 for locus of control was significant at the .010 level indicating that internal students scored significantly better on the composite achievement scores on the Iowa Test of Basic Skills than did external students.

Consequently, hypothesis 3b was rejected at the .05
### Table 11
Adjusted Means for Composite Achievement by Classroom Climate and Locus of Control

<table>
<thead>
<tr>
<th>Group</th>
<th>Composite Means Adjusted for Covariates and Independents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>53.97</td>
</tr>
<tr>
<td>Non-Open</td>
<td>57.30</td>
</tr>
<tr>
<td>Internal</td>
<td>58.88</td>
</tr>
<tr>
<td>External</td>
<td>52.25</td>
</tr>
</tbody>
</table>

### Table 12
Analysis of Covariance Summary Table for Composite Achievement by Open and Non-Open Classroom Climates and Internal-External Locus of Control

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects</td>
<td>2</td>
<td>1699.190</td>
<td>849.595</td>
<td>4.188</td>
<td>.017</td>
</tr>
<tr>
<td>School</td>
<td>1</td>
<td>343.042</td>
<td>343.042</td>
<td>1.691</td>
<td>.196</td>
</tr>
<tr>
<td>LOC</td>
<td>1</td>
<td>1372.914</td>
<td>1371.914</td>
<td>6.762</td>
<td>.010</td>
</tr>
<tr>
<td>Interactions</td>
<td>1</td>
<td>2.518</td>
<td>2.518</td>
<td>.012</td>
<td>.911</td>
</tr>
<tr>
<td>Residual</td>
<td>120</td>
<td>24344.918</td>
<td>202.874</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
level of significance and hypotheses 3a and 3c were retained.

Research hypothesis 4: There is no mean difference in self-concept scores between internal and external students in open and non-open school environments.

This hypothesis was tested by examining the three following related hypotheses.

Hypothesis 4a: There is no mean difference in self-concept scores in open and non-open classroom environments.

Hypothesis 4b: There is no mean difference in self-concept scores between internals and externals.

Hypothesis 4c: There is no mean difference in self-concept scores due to the interaction of classroom climates and locus of control.

The statistics utilized to test hypothesis 4 are presented in Tables 13 and 14. Table 13 contains the means of scores pertinent to this hypothesis. Table 14 is the analysis of variance summary table. The results of the analysis of hypothesis 4 are strikingly similar to hypotheses 1 and 3. An F value of .253 for interaction effects was not significant. The main effects additive model F value of 10.187 was significant at the .001 level. The F value of .978 for classroom climate was not significant whereas the F value for locus of control of 19.321 was significant at the .001 level. Internal students scored significantly higher on measures of self-concept than did external students.
### Table 13
Adjusted Means for Self-Concept Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Self-Concept Means Adjusted for Independents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>64.62</td>
</tr>
<tr>
<td>Non-Open</td>
<td>62.02</td>
</tr>
<tr>
<td>Internal</td>
<td>69.21</td>
</tr>
<tr>
<td>External</td>
<td>57.66</td>
</tr>
</tbody>
</table>

### Table 14
Analysis of Variance Summary Table for Student Self-Concept by Open and Non-Open Classroom Climates and Internal-External Locus of Control

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects</td>
<td></td>
<td>4397.639</td>
<td>2198.820</td>
<td>10.187</td>
<td>.001</td>
</tr>
<tr>
<td>School</td>
<td>1</td>
<td>211.003</td>
<td>211.003</td>
<td>.978</td>
<td>.325</td>
</tr>
<tr>
<td>LOC</td>
<td>1</td>
<td>4170.446</td>
<td>4170.446</td>
<td>19.321</td>
<td>.001</td>
</tr>
<tr>
<td>Interactions</td>
<td>1</td>
<td>54.629</td>
<td>54.629</td>
<td>.253</td>
<td>.616</td>
</tr>
<tr>
<td>Residual</td>
<td>120</td>
<td>26117.524</td>
<td>215.347</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Consequently, hypothesis 4b was rejected at the .05 level of significance and hypotheses 4a and 4c were retained.

A summary of the findings is presented in Table 15. The three main hypotheses concerning the cognitive measures of reading achievement, mathematics achievement, and composite achievement were rejected at the .05 level of significance. The main hypothesis concerning the affective measure of self-concept was also rejected at the .05 level of significance. In addition, the related hypotheses concerning reading and composite achievement and self-concept between internals and externals were rejected at the .05 level of significance. Students with an internal locus of control scored significantly better on these three measures than did students with an external locus of control. No significant differences were found for classroom climate or interaction effects.
Table 15
Summary Table of Research Hypotheses

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>p</th>
<th>Retained</th>
<th>Rejected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reading Achievement by School and Locus of Control with IQ Covariate</td>
<td>.001</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>1a. by School</td>
<td>.053</td>
<td>✗</td>
<td></td>
</tr>
<tr>
<td>1b. by Locus of Control</td>
<td>.001</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>1c. Interaction</td>
<td>.310</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>2. Mathematics Achievement by School and Locus of Control with IQ Covariate</td>
<td>.037</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>2a. by School</td>
<td>.059</td>
<td>✗</td>
<td></td>
</tr>
<tr>
<td>2b. by Locus of Control</td>
<td>.075</td>
<td>✗</td>
<td></td>
</tr>
<tr>
<td>2c. Interaction</td>
<td>.608</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>3. Composite Achievement by School and Locus of Control with IQ Covariate</td>
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<tr>
<td>3a. by School</td>
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<td>✗</td>
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<tr>
<td>3b. by Locus of Control</td>
<td>.010</td>
<td></td>
<td>✗</td>
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<tr>
<td>3c. Interaction</td>
<td>.911</td>
<td></td>
<td>✗</td>
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<td>4. Self-Concept by School and Locus of Control</td>
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<td></td>
<td>✗</td>
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<tr>
<td>4a. by School</td>
<td>.325</td>
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<td></td>
</tr>
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<td>✗</td>
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<tr>
<td>4c. Interaction</td>
<td>.616</td>
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</table>
Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter contains a summary of the findings of this study, conclusions, and recommendations for future research.

The purpose of this study was to determine whether children could benefit from differing educational environments either in a cognitive or affective sense. It investigated the relationships between two types of classroom climate and the locus of control personality construct. The dependent variables were the cognitive measures of reading achievement, mathematics achievement, and composite achievement scores and the affective measure of self-concept.

This study was conducted in an independent suburban school district near a midwestern metropolitan area. The subjects for the study were 125 sixth grade students from six selected classrooms during the 1977-78 school year. Three open and three non-open classrooms were selected for this study. Classroom openness was determined through the use of the DISC VI questionnaire. Locus of control scores were obtained through the use of the Children's Nowicki-Strickland Internal-External Scale. Measures of achievement were obtained from the Iowa Test of Basic Skills. Self-concept measures were obtained from the Coopersmith Self-Esteem Inventory.
An analysis of covariance procedure was used to test for differences between means on the criterion measures of reading, mathematics, and composite achievement scores. Analysis of variance was used to test for differences between means on the criterion measure of self-concept.

Summary and Interpretation of Findings

The hypotheses to which this study were addressed are stated below. Each hypothesis was tested by examining three related hypotheses. Hypotheses 1 through 3 concerned the cognitive variables of reading achievement, mathematics achievement, and composite achievement scores. The following hypotheses were tested at the .05 level of significance.

Research hypothesis 1. There is no mean difference in reading achievement, adjusted for IQ effects, between internal and external students in open and non-open school environments. This hypothesis was rejected at the .05 level because the value of the computed $F$ ratio for main effects had a probability of .001.

Hypothesis 1a. There is no mean difference in reading achievement, after adjusting for IQ, in open and non-open classroom environments. The probability of the $F$ ratio computed to test this hypothesis was .053.

Hypothesis 1b. There is no mean difference in reading achievement, after adjusting for IQ, between internals and externals. This hypothesis was rejected at
the .05 level since the value of the computed F ratio had a probability of .001.

Hypothesis 1c. There is no mean difference in reading achievement, after adjusting for IQ, due to the interaction of classroom climates and locus of control. The probability of the F ratio computed to test this hypothesis was .310.

Research hypothesis 2. There is no mean difference in mathematics achievement, adjusted for IQ effects, between internal and external students in open and non-open school environments. This hypothesis was rejected at the .05 level because the value of the computed F ratio for main effects had a probability of .037.

Hypothesis 2a. There is no mean difference in mathematics achievement, after adjusting for IQ, in open and non-open classroom environments. The probability of the F ratio computed to test this hypothesis was .059.

Hypothesis 2b. There is no mean difference in mathematics achievement, after adjusting for IQ, between internals and externals. The probability of the F ratio computed to test this hypothesis was .075.

Hypothesis 2c. There is no mean difference in mathematics achievement, after adjusting for IQ, due to the interaction of classroom climates and locus of control. The probability of the F ratio computed to test this hypothesis was .265.
Research hypothesis 3. There is no mean difference in the composite achievement scores, adjusted for IQ effects, between internal and external students in open and non-open school environments. This hypothesis was rejected at the .05 level because the value of the computed F ratio for main effects had a probability of .017.

Hypothesis 3a. There is no mean difference in the composite achievement scores, after adjusting for IQ, in open and non-open classroom environments. The probability of the F ratio computed to test this hypothesis was .196.

Hypothesis 3b. There is no mean difference in the composite achievement scores, after adjusting for IQ, between internals and externals. This hypothesis was rejected at the .05 level since the value of the computed F ratio had a probability of .010.

Hypothesis 3c. There is no mean difference in the composite achievement scores, after adjusting for IQ, due to the interaction of classroom climates and locus of control. The probability of the F ratio computed to test this hypothesis was .911.

Hypothesis 4 concerned the affective variable of self-concept.

Research hypothesis 4. There is no mean difference in self-concept scores between internal and external students in open and non-open school environments. This hypothesis was rejected at the .05 level because the value
of the computed F ratio for main effects had a probability of .001.

Hypothesis 4a. There is no mean difference in self-concept scores in open and non-open classroom environments. The probability of the F ratio computed to test this hypothesis was .325.

Hypothesis 4b. There is no mean difference in self-concept between internals and externals. This hypothesis was rejected at the .05 level since the value of the computed F ratio had a probability of .001.

Hypothesis 4c. There is no mean difference in self-concept scores due to the interaction of classroom climates and locus of control. The probability of the F ratio computed to test this hypothesis was .253.

The results of testing the research hypotheses on the cognitive measures of reading achievement and composite achievement indicated that students with an internal locus of control scored significantly better than students with an external locus of control. These results are in agreement with the research studies of Crandall et al., McGhee and Crandall, Messer, and Wolk and DuCette cited in Chapter 2. Individuals who believe they can, through their own efforts, accomplish desired goals, exhibit significantly higher scores in reading achievement and composite achievement as measured by the Iowa Test of Basic Skills.

The results of testing the research hypothesis on
the cognitive measure of mathematics achievement also indicated a significant main effect. However, neither of the main effects of locus of control nor classroom climate were significant at the .05 level. The failure of the individual main effects to reach significance can occur with unequal cell frequencies such as those utilized in this study thus indicating some association between these two factors.

The higher means that were found for students in the non-open classrooms on the cognitive measures of reading, mathematics, and composite achievement may lead to the inference that a more structured, teacher-directed program will result in higher achievement scores as measured by the Iowa Test of Basic Skills. Therefore, if academic achievement is the only desired goal for education the more structured approach may be appropriate.

The results of testing the research hypothesis on the affective measure of self-concept support the findings that students with an internal locus of control scored significantly better than students with an external locus of control. Students who feel that they, rather than luck, fate, or chance, can exert control over their actions and reinforcements have a significantly higher self-concept regardless of type of classroom climate. These results are consistent with those reported by Beebe (1970) and Michaels (1970).

Examination of the Pearson product-moment
correlations for the total sample indicated that locus of control and self-concept are significantly correlated. Because students in the open classrooms have higher self-concepts and consequently possess more internal locus of control the open classroom may be a more suitable environment for the lower grades where subject matter acquisition may not be so important as in the upper grades. Emphasis on academic achievement, as measured by norm-referenced tests generally beginning at the third grade level, may tend to lower self-concept possibly making the child more externally controlled and therefore lowering overall academic achievement. Once children develop more positive self-concepts with a corresponding increase in internality they may function more effectively in either type of classroom environment in the upper grades in academic achievement.

Conclusions

Three general conclusions can be drawn from the findings of this study.

1. On the measure of the cognitive ability of reading achievement as measured by the Iowa Test of Basic Skills, students with an internal locus of control scored significantly better than students with an external locus of control regardless of the type of classroom environment.

2. On the measure of the cognitive ability of composite
achievement as measured by the Iowa Test of Basic Skills, students with an internal locus of control scored significantly better than students with an external locus of control regardless of the type of classroom climate.

3. On the affective measure of self-concept as measured by the Coopersmith Self-Esteem Inventory, students with an internal locus of control scored significantly better than students with an external locus of control regardless of the type of classroom environment.

These results appear to support the necessity of providing students in all types of classrooms with opportunities to perceive the relationships between their actions and reinforcements thus attaining a more internal locus of control. An internal locus of control should enable the students to experience greater success in both the cognitive and affective areas of educational experience.

Recommendations for Future Research

Based upon the results and generalizations derived from this study, future researchers might address themselves to the following suggestions and recommendations:

1. Studies are needed which replicate this study to evaluate the generalizability of the findings.

2. Studies are needed utilizing lower grade populations to determine if similar conclusions can be drawn for
all ages of elementary children.

3. Studies are needed which include the variable of sex in the analysis. In previous studies with locus of control, sex has proven to be a significant variable.

4. Studies are needed to determine the cause of the significant main effects found for mathematics achievement. Replication with equal cell frequencies may indicate whether the significant difference found in this study is related to locus of control or classroom environment.

5. Studies are needed which utilize classrooms in the mid-range of openness as well as the extremes to determine whether student types, as identified by a measure of locus of control, could be matched to classroom type to provide greater opportunities for student success in school.

6. Studies are needed which will identify methods of influencing or modifying locus of control in the internal direction.

7. Studies are needed with diverse populations such as the gifted, retarded, handicapped, and learning disabled, to determine if the conclusions of this study are generalizable to these populations.

8. Studies are needed utilizing other cognitive and affective measures to determine if locus of control
has a similar effect in these areas.

9. Studies are needed utilizing differing methods of determining the openness of classroom environments.

10. Studies are needed which will enable educators to distinguish between achievement motivation and locus of control.

11. Studies of a longitudinal nature are needed to determine the effects of the emphasis on academic testing and its resulting influence on a child's locus of control.

12. Studies of a longitudinal nature are needed to determine which areas of the school curriculum have the greatest influence on a child's locus of control.

These recommendations may provide additional information for educators enabling them to better meet the needs of the individual students in the classrooms.
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BIBLIOGRAPHY

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APPENDICES
APPENDIX A

DIMENSIONS OF SCHOOLING QUESTIONNAIRE FORM VI
DIMENSIONS OF SCHOOLING QUESTIONNAIRE FORM VI

Teacher ________________________________

School ________________________________

Date ________________________________

Grade level ________________________________

The purpose of the questionnaire is to obtain a description of your class on a variety of dimensions. Before responding note the following points carefully.

1. **RESPOND TO THE ITEMS IN TERMS OF WHAT ACTUALLY HAPPENS IN YOUR SCHOOL SITUATION. DO NOT RESPOND IN TERMS OF WHAT YOU THINK SHOULD HAPPEN.**

2. "Class" in this questionnaire is defined as the group of students assigned to you at this time.

3. Each page contains one dimension of schooling which is described by several categories.

4. Read all of the categories on each page before responding to that dimension.

5. For each dimension, rank the categories in terms of how well they describe your class situation. Assign the highest rank (1) to the category which occurs most often or to the most students. Assign the second highest rank (2) to the category which happens the next most often... and so on down to the lowest ranked category.

6. Do not rank categories which are inappropriate to your situation. But do rank at least one category on a page. Do not skip a page.

7. For any item do not use the same rank for more than one option (that is, avoid ties).
EXAMPLE ITEM

Library Usage. This item is concerned with the students' opportunities to go to the library.

A. Students go to the school library individually whenever they wish.

B. Students go to the school library individually with the teacher's permission.

C. Students go to the school library in groups with the teacher's or librarian's supervision.

D. Students go to the school library mainly outside regular school hours.

The response in the example describes a situation in which the most frequently occurring category is "C", so it is ranked number 1; the second most frequently occurring category is "A", so a "2" is placed in the box by category "A"; the third most frequently occurring category is "B", so a "3" is placed in the box by category "B" and "D" simply does not occur, so no mark is made in the box by "D".
1. ASSIGNMENT OF STUDENTS TO TEACHERS. This section is concerned with who makes the decisions about student assignment to teachers.

A. Class assignments are decided upon by students.

B. Class assignments are decided upon by parents.

C. Class assignments are decided upon by teachers.

D. Class assignments are decided upon by principal or vice principal.
2. **AGE RANGE.** This section is concerned with the range of age of students assigned to a teacher.

A. Students assigned to a teacher are about the same age; age is the primary criterion for assigning a student to a class.

B. Students assigned to a teacher are in a two or three year age range; there is a semi-graded system which will allow, to some extent, that individual differences in physical, social and intellectual maturity will be considered in assigning students to a class or grade.

C. Students assigned to a teacher vary in age by more than three years; there is a multiage system which allows students with a wide variety of qualifications and ages to be in the same class.
3. **TIME SCHEDULING.** This section is concerned with the amount of time which is blocked into scheduled activities.

A. Fully unscheduled: Activities (e.g. math or other subjects, outdoor play, work with art materials, etc.) are not scheduled but occur as students' and/or teachers' interests dictate.

B. Mostly unscheduled: Activities are not scheduled for most of the day, but there are some activities (no more than 1/4 of the day) that are held at specific times (e.g. a French lesson given by a teacher who comes from outside the school for reading, etc.)

C. Scheduled and unscheduled: Approximately 1/2 the day is unscheduled with the other 1/2 blocked into scheduled activities.

D. Mostly scheduled: Activities are scheduled for most of the day (about 3/4) but the rest of the time is left unscheduled so that activities occur as students' and teachers' interests dictate.

E. Fully scheduled: The full day is organized into activities that occur according to some pre-arranged time table.
4. **FREE TIME.** This section is concerned with the amount of time during which students are free to pursue their own interests. This is not the same as independent study time where students work on projects or assignments in a particular subject area.

A. The entire day is available for students to pursue their own interests (free time).

B. At least half the day is available as free time.

C. One to two hours of free time are available each day.

D. Less than one hour of free time is available each day.

E. There is no free time available.
5. **RULE MAKING.** This section is concerned with determining who makes the rules which govern school behavior.

A. Rules for student conduct are made by the administrative staff (principal, vice principal).

B. Rules for student conduct are made by the teachers.

C. Rules for student conduct are made by the parents.

D. Rules for student conduct are made by the students.
5. RULE MAKING. This section is concerned with determining who makes the rules which govern school behavior.

A. Rules for student conduct are made by the administrative staff (principal, vice principal).

B. Rules for student conduct are made by the teachers.

C. Rules for student conduct are made by the parents.

D. Rules for student conduct are made by the students.
6. RULE ENFORCING. This section is concerned with determining who enforces the rules governing general school behavior.

A. Rules for student conduct are enforced by the administrative staff (principal, vice principal).

B. Rules for student conduct are enforced by the teachers.

C. Rules for student conduct are enforced by the parents.

D. Rules for student conduct are enforced by the students.
DEFINING GENERAL OBJECTIVES. This section is concerned with who determines the general objectives, (aims, goals, philosophy, expected outcomes) of schooling.

A. General objectives are determined by the school board, and/or the central administrative staff.

B. General objectives are determined by the principal and/or vice-principal.

C. General objectives are determined by teachers.

D. General objectives are determined by parents.

E. General objectives are determined by students.
8. CONTENT ORGANIZATION. This item is concerned with the way that content is organized as part of the program.

A. Content is organized along traditional subject matter lines (e.g. math, science, social studies).

B. Content is combined into two or more groupings of subjects (e.g. environmental studies, communication arts).

C. Content is integrated; there is no attempt to organize content into subjects or groupings.
ADDITIONAL INSTRUCTIONS

Dimensions 1-8, just completed, were concerned with general school procedures as they affect your class program. The following dimensions, 9-32, relate to specific program organization in your instructional area for each subject that you teach.

1. Please respond as before by ranking the categories in terms of how well they describe your class situation for each of the subject areas you teach. This will require a column of ranks for each subject that you teach.

2. If you teach a subject which is not listed, respond in the column headed "Other," and specify the subject by writing it after the word "Other."

3. If you teach "Integrated Subjects," respond in the column headed "Other," and specify "Integrated Subjects" after the word "Other," and write below it the subjects that are integrated.

4. If the "Other" columns are used, please write the subject names above the same columns on each page.

EXAMPLE ITEM

Film Projector Usage. This item concerns the accessibility of film projectors to students.

A. Students use a projector whenever they wish.

B. Students use a projector with the teacher's permission.

C. The teacher determines when the projector is used.

D. A projector is not used.

<table>
<thead>
<tr>
<th>Science</th>
<th>Math</th>
<th>Social Studies</th>
<th>Reading</th>
<th>Lang. Arts</th>
<th>Other (French)</th>
<th>Other</th>
</tr>
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</table>
This respondent teaches Science, Math, Social Studies, and French. Since French was not listed, it was written after the word "Other." For each subject area (each column), the categories were ranked which actually occur in the class where that subject is taught.

For example, in Science, category "B" occurs most often or with the most students in the class. Therefore, it was given a rank of "1." Category "C" occurs, but less frequently or with fewer students, so was given a rank of "2". Categories "A" and "D" do not occur at all, so were not ranked. Then the Math, Social Studies, and French columns were ranked according to the categories which occur in each of those classes.

Note that there are no ties (duplicate ranks) in any one of the subject columns.
9. **DETERMINING INSTRUCTIONAL OBJECTIVES.** This section is concerned with who determines the content and activities of the program.

A. Instructional objectives are determined by the school board, and/or central administrative staff.

B. Instructional objectives are determined by the principal and/or vice-principal.

C. Instructional objectives are determined by teachers.

D. Instructional objectives are determined by parents.

E. Instructional objectives are determined by students.
10. DEVELOPMENT OF MATERIALS. This section is concerned with the amount of personal involvement that students and teachers have in the development of materials for the classroom.

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<th>Science</th>
<th>Math</th>
<th>Social Studies</th>
<th>Reading, Lang. Arts</th>
<th>Other</th>
<th>Other</th>
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</table>

A. There is little involvement of teachers and/or students in developing materials; i.e. most materials in use are ready-to-use "packages" (e.g. reading series, sets of math texts, computer-assisted instruction, etc.).

B. There is some involvement of teachers and/or students in developing materials; i.e. most materials in use are things chosen by teachers, students, or others from a wide variety of sources in a ready-to-use form (e.g. books not in series, an abacus, a film, etc.).

C. There is a great deal of involvement of teachers and/or students in developing materials; i.e. most materials in use have been developed, created or adapted by students, teachers and others specifically for situations which arose in this classroom (e.g. collections of objects for use in working out math problems, student-made books, tape recordings or films made by students or teachers, equipment built by parents, etc.).
11. **SELECTION OF MATERIALS.** This section is concerned with the involvement students have in selecting materials with which to work.

A. **Students choose for themselves from all the materials available and may bring in materials from outside the classroom.**

B. **Students choose from alternatives suggested by the teacher.**

C. **Students are assigned materials prescribed for them individually.**

D. **Student is assigned materials prescribed to members of his subgroup of the class. (Same materials for all students in the same subgroup; different materials for each subgroup.)**

E. **Student is assigned materials prescribed to all members of his class. (Same materials for all students in the same class.)**
12. **STUDENTS' MOBILITY.** This section is concerned with the amount of freedom which students have to move around the school on a regular basis.

A. Students do not need the permission of the teacher to leave the classroom, but freely move in and out of the room (or area) to use the library, resource centre, etc.

B. Students must ask the teacher's permission to move in and out of the classroom to use the library, resource centre, etc., but permission is usually given readily.

C. Students move in and out of the classroom to use the library, resource centre, etc., only in special circumstances (i.e. with special permission) or as class groups.
13. **FLEXIBILITY OF ENVIRONMENT.** This section is concerned with who makes the decisions about the arrangement and the setting of the learning area.

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<th>Reading, Lang., Arts</th>
<th>Other</th>
<th>Other</th>
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**A.** The arrangement of furniture and equipment in the learning area is decided upon by the administrative staff.

**B.** The arrangement of furniture and equipment in the learning area is decided upon and changed by the teachers.

**C.** The arrangement of furniture and equipment in the learning area is decided upon and changed by the students.
14. **LEARNING ENVIRONMENT.** This section concerns the size of the area used by students during the school day.

A. Learning activities take place at the student's own desk or table.

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<th></th>
<th>Science</th>
<th>Math</th>
<th>Social Studies</th>
<th>Reading</th>
<th>Lang. Arts</th>
<th>Other</th>
<th>Other</th>
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B. Learning activities take place in a number of different places (centers) within the classroom area.

C. Learning activities take place in a number of different places (centers) within the school.

D. Learning activities take place outside the school; the community and its institutions are incorporated into the learning environment.
15. STUDENT PACING. This section is concerned with the pace at which the student works.

A. The student is expected to work at a pace set for all members of the class.

B. The student is expected to work at a pace set for the members of his subgroup of the class.

C. The student works at a pace prescribed for him individually.

D. The student sets his own pace.
16. INDEPENDENT STUDY TIME. This section concerns the availability of independent study time; students work by themselves on projects of their choice but in keeping with the wide range objectives of the subject area (e.g. during a geography unit on the Middle East, a student might use his independent study time to create a paper mache relief map of the Sinai Peninsula).

A. Independent study time is available for more than 3 hours per week.

B. Independent study time is available from 1-3 hours per week.

C. Independent study time is available less than 1 hour per week.

D. Independent study time is not available.
17. STUDENT INTERACTION. This item is concerned with the students' opportunities to interact through discussion with his peers.

A. Interaction with peers through discussion is not encouraged; each student is expected to work independently without exchanging ideas with his peers.

B. Interaction with peers through discussion is permitted at certain times particularly after assignments have been completed.

C. Interaction with peers through discussion is encouraged by the teacher and a regular part of the learning.
18. FORMULATING APPROACHES TO LEARNING. This section is concerned with the extent to which teachers help students arrive at approaches to learning and problem solving.

A. Students formulate their own methods of learning and solving problems (e.g. a student studying the Arctic independently consults several people, looks in the card catalogue at the library, and writes to the government for information).

B. Students choose from alternative methods suggested by the teacher for learning and solving problems (e.g. a student studying the Arctic asks the teacher for help. The teacher suggests two books, a film strip and writing to the government).

C. Students are assigned methods by the teacher for learning and solving problems (e.g. a student studying the Arctic is assigned the tasks of writing a letter to the government, reading two books, and viewing a filmstrip).
19. **PEER GROUP ASSISTANCE.** This section is concerned with the extent to which students work with other students on schoolwork.

<table>
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<tr>
<th>A. Students independently seek assistance in their schoolwork from peers or other students; this is accepted and encouraged as a valid way of seeking solutions or of exploration.</th>
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<tr>
<td>B. There is student-to-student assistance on a teacher-initiated basis (e.g. the teacher assigns a good reader to help a poorer reader or arranges for a tutor).</td>
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<td>C. Assistance comes from the teacher.</td>
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26. OTHER ADULT INVOLVEMENT. This section is concerned with the involvement of adults other than teachers in the classroom.

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<th>Science</th>
<th>Math</th>
<th>Social Studies</th>
<th>Reading, Lang., Arts</th>
<th>Other</th>
<th>Other</th>
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</table>

A. All teaching is done by the regular classroom teacher and special subject teachers.

B. Although most of the teaching is done by the classroom and special teachers, occasionally there are visitors, parents or volunteers who have special knowledge of a topic, or who help in a practical way in the classroom.

C. Although much of the teaching is done by the classroom and special teachers, there are regularly involved parents, volunteers and frequent visitors who are welcome in the classroom and whose involvement is considered an important part of the learning experience.
21. COOPERATIVE PLANNING. This section is concerned with the extent to which teachers plan their program together and share information about students.

A. Teachers plan and teach independently of each other and share little or no information about students.

B. Teachers plan and teach together but do not share information about students.

C. Teachers plan and teach independently but do share information about students.

D. Teachers plan and teach together and share information about students.
22. **MEDIA USAGE.** This section concerns the selection and use of media as teaching aids in instruction.

<table>
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<tr>
<th></th>
<th>Science</th>
<th>Math</th>
<th>Social Studies</th>
<th>Reading, Lang. Arts</th>
<th>Other</th>
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<tbody>
<tr>
<td>A.</td>
<td>The teacher takes responsibility for selecting and using media.</td>
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<tr>
<td>B.</td>
<td>The teacher takes responsibility for selecting media which are used by the students.</td>
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<tr>
<td>C.</td>
<td>Students take responsibility for selecting and using media.</td>
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</tr>
</tbody>
</table>
23. **TEACHER FOCUS.** This section concerns the size of the student group addressed by the teacher at one time.

A. The teacher directs attention to the class as a whole.

B. The teacher directs attention to subgroups of the class.

C. The teacher directs attention to individual students.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Science</th>
<th>Math</th>
<th>Social Studies</th>
<th>Reading, Lang., Arts</th>
<th>Other</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
24. **TEACHER ROLE.** This section is concerned with the role the teacher plays in the student's contact with what is being learned.

<table>
<thead>
<tr>
<th></th>
<th>Science</th>
<th>Math</th>
<th>Social Studies</th>
<th>Reading, Lang., Arts</th>
<th>Other</th>
<th>Other</th>
</tr>
</thead>
</table>

A. The teacher provides guidance as a resource person to whom students come when in need of assistance.

B. The students choose topics for study and the teacher organizes instructional activities.

C. The teacher chooses topics for study and organizes instructional activities.

D. The teacher provides instruction through a sequence of planned lessons.
25. **SUBGROUPING CRITERIA.** This section is concerned with how subgroups within the class are developed.

A. Students group themselves according to their own criteria (e.g. interests, friendships, etc.).

B. Students are grouped by the teacher on the basis of information about students' interests, aptitude, achievement, or social maturity.

C. Students are grouped by the teacher on the basis of random assignment (e.g. alphabetically, by sex, or age).
26. **SUBGROUPING STABILITY.** This item is concerned with the establishment and change in the composition of subgroups within the class.

<table>
<thead>
<tr>
<th>Science</th>
<th>Math</th>
<th>Social Studies</th>
<th>Reading, Lang, Arts</th>
<th>Other</th>
<th>Other</th>
</tr>
</thead>
</table>

A. Subgroups within the class are established for the duration of a specified period of time (e.g. for the school year or for a term).

B. Subgroups within the class are established and/or reorganized when the teacher feels it is necessary and/or desirable (e.g. for a new activity or when students' interests change).

C. Subgroups within the class are established and/or reorganized when students feel it is necessary and/or desirable (e.g. for a new activity or when students' interests change).
27. **PROMOTION TIMING.** This section is concerned with the timing of student placement decisions.

A. Promotion decisions are made at the end of the school year or term.

B. Promotion decisions are made at the end of each unit of study.

C. Promotion decisions are made whenever it seems appropriate for the individual student.

D. Promotion does not occur. Rather, students remain in a class unit or intact group for several years.
28. EVALUATION FOCUS. This section is concerned with the size of the group being evaluated.

A. Evaluation procedures are the same for all students in the school.

B. Evaluation procedures are the same for all students in the class, but differ from class to class in the school.

C. Evaluation procedures are the same for each student within a subgroup of the class but differ from subgroup to subgroup.

D. Evaluation procedures are different for each student in the class.
29. TIMING OF EVALUATION. This section is concerned with the time(s) at which evaluation takes place.

A. Evaluation takes place at the end of each term.

B. Evaluation takes place at the end of each unit of work.

C. Evaluation takes place several times during a unit of work.

D. Evaluation takes place every day.
**Student Role in Evaluation.** This section is concerned with the degree to which students plan and use evaluation information for self-evaluation purposes.

<table>
<thead>
<tr>
<th></th>
<th>Science</th>
<th>Math</th>
<th>Social Studies</th>
<th>Reading, Lang. Arts</th>
<th>Other</th>
<th>Other</th>
</tr>
</thead>
</table>

A. Students plan evaluation and use results for self-evaluation purposes.

B. Teachers plan evaluation and students use results for self-evaluation purposes.

C. Teachers plan evaluation and do not provide information for student self-evaluation.

D. The administration plans evaluation and does not provide information for student self-evaluation.
31. EVALUATION PROCEDURES. This section concerns the types of tests and other evaluation instruments used in student evaluation.

A. Evaluation is based on work samples and anecdotal reports.

B. Evaluation instruments used were developed in this classroom.

C. Evaluation instruments used were developed within the school (by other teachers or in previous years).

D. Standardized (commercial) instruments are used.
32. **STUDENTS' MOBILITY WITHIN THE CLASSROOM/INSTRUCTIONAL AREA.** This section is concerned with the amount of freedom which students have to move around the class area on a regular basis.

<table>
<thead>
<tr>
<th></th>
<th>Science</th>
<th>Math</th>
<th>Social Studies</th>
<th>Reading, Arts</th>
<th>Other</th>
<th>Other</th>
</tr>
</thead>
</table>

A. **Students move freely about the class area without asking the teacher's permission** (to sharpen pencils, wash hands, talk to another student, work in different learning centers, to get materials, etc.).

B. **Students must ask the teacher's permission to move about the classroom.**

C. **Students do not move about the class area except after explicit directions from the teacher.**
NOTE: We consider your time and your answers very valuable to you and to us. Please help us to make it all worthwhile and your answers usable by checking how to see that:

1. All the information requested on the front cover page is completed.
2. You have not omitted marking a dimension (page).
3. You have written in the subjects at the top of each "Other" column.
4. You have no tied (duplicate) ranks in any one vertical (subject) column.

THANK YOU!
APPENDIX B

CHILDREN'S NOWICKI-STRICKLAND INTERNAL-EXTERNAL CONTROL SCALE
CHILDREN'S NOWICKI-STRICKLAND INTERNAL-EXTERNAL CONTROL SCALE

DIRECTIONS: Answer the following questions by circling either (yes) or (no) after each one.

1. Do you believe that most problems will solve themselves if you just don't fool with them? yes no
2. Do you believe that you can stop yourself from catching a cold? yes no
3. Are some kids just born lucky? yes no
4. Most of the time do you feel that getting good grades means a great deal to you? yes no
5. Are you often blamed for things that just aren't your fault? yes no
6. Do you believe that if somebody studies hard enough he or she can pass any subject? yes no
7. Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway? yes no
8. Do you feel that if things start out well in the morning that it's going to be a good day no matter what you do? yes no
9. Do you feel that most of the time parents listen to what their children have to say? yes no
10. Do you believe that wishing can make good things happen? yes no
11. When you get punished does it usually seem it's for no good reason at all? yes no
12. Most of the time do you find it hard to change a friend's (mind) opinion? yes no
13. Do you think that cheering more than luck helps a team to win? yes no
14. Do you feel that it's nearly impossible to change your parent's mind about anything? yes no
15. Do you believe that your parents should allow you to make most of your own decisions? yes  no

16. Do you feel that when you do something wrong there's very little you can do to make it right? yes  no

17. Do you believe that most kids are just born good at sports? yes  no

18. Are most of the other kids your age stronger than you are? yes  no

19. Do you feel that one of the best ways to handle most problems is just not to think about them? yes  no

20. Do you feel that you have a lot of choice in deciding who your friends are? yes  no

21. If you find a four-leaf clover do you believe that it might bring you good luck? yes  no

22. Do you often feel that whether you do your homework has much to do with what kind of grades you get? yes  no

23. Do you feel that when a kid your age decides to hit you, there's little you can do to stop him or her? yes  no

24. Have you ever had a good luck charm? yes  no

25. Do you believe that whether or not people like you depends on how you act? yes  no

26. Will your parents usually help you if you ask them to? yes  no

27. Have you felt that when people were mean to you it was usually for no reason at all? yes  no

28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today? yes  no

29. Do you believe that when bad things are going to happen they just are going to happen no matter what you try to do to stop them? yes  no
30. Do you think that kids can get their own way if they just keep trying?  
   yes  no
31. Most of the time do you find it useless to try to get your own way at home?  
   yes  no
32. Do you feel that when good things happen they happen because of hard work?  
   yes  no
33. Do you feel that when somebody your age wants to be your enemy there's little you can do to change matters?  
   yes  no
34. Do you feel that it's easy to get friends to do what you want them to?  
   yes  no
35. Do you usually feel that you have little to say about what you get to eat at home?  
   yes  no
36. Do you feel that when someone doesn't like you there's little you can do about it?  
   yes  no
37. Do you usually feel that it's almost useless to try in school because most other children are just plain smarter than you are?  
   yes  no
38. Are you the kind of person who believes that planning ahead makes things turn out better?  
   yes  no
39. Most of the time, do you feel that you have little to say about what your family decides to do?  
   yes  no
40. Do you think it's better to be smart than to be lucky?  
   yes  no
APPENDIX C

COOPERSMITH SELF-ESTEEM INVENTORY (SEI)
COOPERSMITH SELF-ESTEEM INVENTORY (SEI)

Please mark each statement in the following way:

If the statement describes how you usually feel, put a check (✓) in the column, "Like Me."

If the statement does not describe how you usually feel, put a check (✗) in the column "Unlike Me."

There are no right or wrong answers.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Like Me</th>
<th>Unlike Me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I spend a lot of time daydreaming.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I'm pretty sure of myself.</td>
<td></td>
<td></td>
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<tr>
<td>3. I often wish I were someone else.</td>
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<tr>
<td>4. I'm easy to like.</td>
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<tr>
<td>5. My parents and I have a lot of fun together.</td>
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<tr>
<td>6. I never worry about anything.</td>
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<tr>
<td>7. I find it very hard to talk in front of the class.</td>
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<tr>
<td>8. I wish I were younger.</td>
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<tr>
<td>9. There are lots of things about myself I'd change if I could.</td>
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<tr>
<td>10. I can make up my mind without too much trouble.</td>
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<tr>
<td>11. I'm a lot of fun to be with.</td>
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<td></td>
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<tr>
<td>12. I get upset easily at home.</td>
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<td></td>
</tr>
<tr>
<td>13. I always do the right thing.</td>
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<td></td>
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<tr>
<td>14. I'm proud of my school work.</td>
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<tr>
<td>15. Someone always has to tell me what to do.</td>
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</tr>
<tr>
<td>16. It takes me a long time to get used to anything new.</td>
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</tr>
<tr>
<td></td>
<td>Like Me</td>
<td>Unlike Me</td>
</tr>
<tr>
<td>---</td>
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<tr>
<td>17. I'm often sorry for the things I do.</td>
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<tr>
<td>18. I'm popular with kids my own age.</td>
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<tr>
<td>19. My parents usually consider my feelings.</td>
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<tr>
<td>20. I'm never unhappy.</td>
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<tr>
<td>21. I'm doing the best work that I can.</td>
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<tr>
<td>22. I give in very easily.</td>
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<td></td>
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<tr>
<td>23. I can usually take care of myself.</td>
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<td></td>
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<tr>
<td>24. I'm pretty happy.</td>
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<tr>
<td>25. I would rather play with children younger than me.</td>
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<td></td>
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<tr>
<td>26. My parents expect too much of me.</td>
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<td></td>
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<tr>
<td>27. I like everyone I know.</td>
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<td></td>
</tr>
<tr>
<td>28. I like to be called on in class.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. I understand myself.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. It's pretty tough to be me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. Things are all mixed up in my life.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. Kids usually follow my ideas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. No one pays much attention to me at home.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. I never get scolded.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. I'm not doing as well in school as I'd like to.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36. I can make up my mind and stick to it.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37. I really don't like being a boy--girl.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38. I have a low opinion of myself.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39. I don't like to be with other people.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
40. There are many times when I'd like to leave home.  

41. I'm never shy.  

42. I often feel upset in school.  

43. I often feel ashamed of myself.  

44. I'm not as nice looking as most people.  

45. If I have something to say, I usually say it.  

46. Kids pick on me very often.  

47. My parents understand me.  

48. I always tell the truth.  

49. My teacher makes me feel I'm not good enough.  

50. I don't care what happens to me.  

51. I'm a failure.  

52. I get upset easily when I'm scolded.  

53. Most people are better liked than I am.  

54. I usually feel as if my parents are pushing me.  

55. I always know what to say to people.  

56. I often get discouraged in school.  

57. Things usually don't bother me.  

58. I can't be depended on.
Table 16
Regression Weights of Criterion Measures on IQ

<table>
<thead>
<tr>
<th>Criterion Measure</th>
<th>Group</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Achievement</td>
<td>Non-Open/Internal</td>
<td>.98204739</td>
</tr>
<tr>
<td></td>
<td>Non-Open/External</td>
<td>1.2396440</td>
</tr>
<tr>
<td></td>
<td>Open/Internal</td>
<td>1.7535221</td>
</tr>
<tr>
<td></td>
<td>Open/External</td>
<td>.98511542</td>
</tr>
<tr>
<td>Mathematics Achievement</td>
<td>Non-Open/Internal</td>
<td>1.2395745</td>
</tr>
<tr>
<td></td>
<td>Non-Open/External</td>
<td>1.5910752</td>
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<td>Open/Internal</td>
<td>1.7877319</td>
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<tr>
<td></td>
<td>Open/External</td>
<td>1.1427356</td>
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<tr>
<td>Composite Achievement</td>
<td>Non-Open/Internal</td>
<td>1.3248166</td>
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<td></td>
<td>Non-Open/External</td>
<td>1.6051121</td>
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<td></td>
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</table>
Table 17
Computed Values of Bartlett-Box $f$
for Criterion Measures

<table>
<thead>
<tr>
<th>Criterion Measure</th>
<th>$F$ value</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Achievement</td>
<td>.323</td>
<td>.809</td>
</tr>
<tr>
<td>Mathematics Achievement</td>
<td>.314</td>
<td>.815</td>
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<td>Composite Achievement</td>
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<td>.991</td>
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<tr>
<td>Self-Concept</td>
<td>.136</td>
<td>.939</td>
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</table>
APPENDIX E

RAW SCORES
Table 18

Raw Scores for Students in Non-Open Classrooms

<table>
<thead>
<tr>
<th>Student</th>
<th>IQ</th>
<th>Locus of Control</th>
<th>Reading</th>
<th>Mathematics</th>
<th>Composite</th>
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<tbody>
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</tbody>
</table>
Table 18 (continued)

<table>
<thead>
<tr>
<th>Student</th>
<th>IQ</th>
<th>Locus of Control</th>
<th>Reading</th>
<th>Mathematics</th>
<th>Composite</th>
<th>Self-Concept</th>
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