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A STUDY OF CHILDREN'S MOTIVATIONAL LEVELS AND ATTITUDES TOWARD SCHOOL AND THEIR RELATIONSHIP TO ACHIEVEMENT IN READING AND ARITHMETIC

The Ohio State University

Ph.D. 1986

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A STUDY OF CHILDREN'S MOTIVATIONAL LEVELS
AND ATTITUDES TOWARD SCHOOL AND THEIR
RELATIONSHIP TO ACHIEVEMENT IN READING AND ARITHMETIC

DISSERTATION

Presented in Partial Fulfillment of
the Requirements for the Degree
Doctor of Philosophy
in the Graduate School of
The Ohio State University

By

John Frederick Berning, B.S. Ed., M.A.

* * * * *

The Ohio State University
1986

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Approved by

Adviser
College of Education:
Theory and Practice
DEDICATION

I dedicate this to my wife, Sandra, without whose help, encouragement, and support this project could not have been completed.

John Berning

August, 1986
ACKNOWLEDGMENTS

I express sincere appreciation to Professor emeritus Alexandér Frazier in the Department of Early and Middle Childhood Education at The Ohio State University. His unstated legacy, I believe, was the improvement of educational services by supporting educators desiring to continue their formal education beyond the Masters level—all the way to the Ph.D. level, if they so desired. Recent salary steps established at the Ph.D. level testify to the growing acceptance of a new level of professional educator. Professor Frazier often expressed a "Why not?" attitude toward new ideas—Ph.D.'s teaching in elementary schools being a case in point. Juxtaposed was often the whimsical "Why?" when confronted with the latest "educational innovation" from an enthusiastic student. I shall always attempt to emulate this open and searching attitude and to perpetuate post graduate education as a means of improving the quality and professionalism of educators.

Also, much appreciation is expressed to my advisor, Dr. Donald Haefele, who read through and edited my many draft copies; to my typist, Mrs. Anita Middleton, who has skillfully typed and retyped those drafts; and to my wife, Sandra, and my children, John and Lee, who have put up with me through this process.
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CONTENTS

PAGE

DEDICATION ........................................ ii
ACKNOWLEDGEMENTS ................................. iii
VITA ........................................ iv
LIST OF TABLES ................................. viii
LIST OF FIGURES ................................ x

CHAPTER

I. INTRODUCTION TO THE PROBLEM .............. 1
   Purpose of the Study ..................... 1
   Statement of the Problem ............. 8
   Significance of the Problem .......... 8

II. REVIEW OF RELATED LITERATURE
    AND STATEMENT OF HYPOTHESES ........ 12
   Introduction .......................... 12
   Labeling Objects and School
   Motivation .......................... 12
   Academic Motivation and Attitudes ... 19
   Differential Achievement in
   Reading and Arithmetic ............. 22
   Research Hypotheses ............... 27

III. PROCEDURES ............................. 32
<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T-Test Comparing Higher and Lower Motivated Groups on School Attitudes</td>
<td>34</td>
</tr>
<tr>
<td>2</td>
<td>Variable Labels and Definitions</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>Pearson Product-Moment Correlation Between Sex, Motivation, and Achievement In Reading and Arithmetic</td>
<td>47</td>
</tr>
<tr>
<td>4</td>
<td>One-Way Analysis of Variance Achievement By Motivation Subgroup</td>
<td>48</td>
</tr>
<tr>
<td>5</td>
<td>Pearson Product-Moment Correlations Between Attitude Scales and Motivation Ratings</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>T-Test for Significant Differences Between Boys' and Girls' Mean Attitude Factors</td>
<td>51</td>
</tr>
<tr>
<td>7</td>
<td>Pearson Product-Moment Correlations Between Total Attitude Measure and Achievement in Reading and Arithmetic</td>
<td>53</td>
</tr>
<tr>
<td>8</td>
<td>Pearson Product-Moment Correlations Between Attitudes and Achievement in Reading and Arithmetic</td>
<td>54</td>
</tr>
<tr>
<td>9</td>
<td>Pearson Product-Moment Correlations Between Teacher Assigned Ability Ratings and Achievement in Reading and Arithmetic</td>
<td>55</td>
</tr>
<tr>
<td>10</td>
<td>Total Attitude Measure By Grade Level</td>
<td>57</td>
</tr>
<tr>
<td>11</td>
<td>One-Way Analysis of Variance Total Attitude Measure by Motivation Subgroup in Grades 2, 4, and 6</td>
<td>57</td>
</tr>
<tr>
<td>12</td>
<td>Total Achievement By Grade Level</td>
<td>58</td>
</tr>
<tr>
<td>13</td>
<td>One-Way Analysis of Variance Achievement by Grade Levels 2, 4, 6</td>
<td>58</td>
</tr>
</tbody>
</table>
14 Pearson Correlations Between TA Motivation and Achievement in Reading and Arithmetic Grades Two, Four, and Six (Urban) .... 59

15 Pearson Correlations Between TA Motivation and Achievement in Reading and Arithmetic In Grades Two and Six (Suburban) .... 59

16 Analysis of Variance (Urban) Total Achievement in Reading and Arithmetic by Grade and Motivation Level .... 62

17 Analysis of Variance (Suburban) Total Achievement in Reading and Arithmetic by Grade and Motivation Level .... 63

18 Tested Relationships Between Major Variables and Results .... 74
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Kagan's Theory of Differential Academic Achievement</td>
<td>6</td>
</tr>
<tr>
<td>2.</td>
<td>Major Variable Investigated (interrelationships)</td>
<td>7</td>
</tr>
<tr>
<td>3.</td>
<td>Results of Factor Analysis of Questionnaires Measuring Strength of Attitudes Toward School and School Activities</td>
<td>41</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

Purpose of the Study

The purpose of this study was to determine the degree to which elementary school children's motivational levels and attitudes toward school were related to their achievement in reading and arithmetic and whether either one related to gender.

A number of research studies have proposed relationships among sex of the pupil, school motivation and academic achievement (Kagan, 1964; Kellogg, 1969; Hill, Hubbs and Verble, 1974). Kagan (1964) proposed a theoretical framework to account for the differential academic achievement of boys and girls in the first four years of school. He reported a linear relationship where the sex of the pupil determined the labeling of school objects as masculine or feminine, which influenced the student's perception of the school environment as sex-appropriate or sex-inappropriate and subsequently increased or decreased the motivation to perform well academically and ultimately affected academic achievement.
Kagan found that second grade children labeled school objects, (e.g., book, page of arithmetic, chalkboard), more frequently feminine than masculine. This labeling he saw as an indication that boys viewed school as sex-inappropriate. He also noted that third grade boys were less likely than second grade boys to label school objects as feminine whereas third grade girls showed no change from second grade in labeling objects feminine. Kagan concluded that:

"It is reasonable to assume that the child's sex-role classification of the school environment governs the degree of motivation he will invest in mastery of academic tasks. For the child should be more highly motivated to master tasks that he perceives as sex-appropriate than those he views as representative of the opposite sex. In sum, more young girls than boys view school activities as congruent with their sex role, and, consequently, they should be more highly motivated to master academic tasks."

The relationships among the variables proposed by Kagan (1964) to account for the differential achievement between boys and girls in the first four grades of elementary school, (see Figure 1), showed that males in the primary grades label school objects as feminine, see school as sex-inappropriate, possess less motivation to perform well academically, and thereby become lower achievers. Juxtaposed were females, who label school objects as feminine, see school as sex-appropriate, possess more motivation to perform well academically, and are thereby, higher achievers.
Kagan's Theory of Differential Academic Achievement

A. MALE STUDENTS
B. LABEL SCHOOL OBJECTS AS FEMININE
C. THEREFORE, SEE SCHOOL AS SEX-INAPPROPRIATE
D. THEREFORE, LESS MOTIVATED TO PERFORM WELL ACADEMICALLY
E. THEREFORE, ACADEMIC ACHIEVEMENT LOWER

FEMALE STUDENTS
LABEL SCHOOL OBJECTS AS FEMININE
THEREFORE, SEE SCHOOL AS SEX-APPROPRIATE
THEREFORE, MORE MOTIVATED TO PERFORM WELL ACADEMICALLY
THEREFORE, ACADEMIC ACHIEVEMENT HIGHER
It is problematic to base inferences about children's school motivation solely on their labeling of school objects as masculine or feminine as done in research by Kagan (1964). A distinction must be made between a subject's attitudes and his motivations. G.H. Mead (1977) notes the following distinction between attitude and motivation:

"An attitude is a predisposition to act in a given way with respect to a given object."

"Motivation, broadly considered, is the arousing, directing, and sustaining of behavior."

According to Mead's definitions of attitude and motivation, when Kagan's subjects labeled school objects as masculine or feminine, they were not supplying indirect evidence related to their motivational levels, but rather were directly expressing their attitudes toward school objects.

The concept of motivation, used by this researcher, adhered to Mead's conceptualization. In this study, motivational groups were determined by teacher nomination, where teachers nominated higher or lower motivated boys and girls based upon the teachers' in-depth knowledge of their students' arousability at school, ability to direct attention to tasks and stay on tasks to completion. Classroom teachers were the best judges of these motivational behaviors because of their extended contact with students over the year and their comprehensive
knowledge of their students' behaviors.

Kellogg, (1969), replicating Kagan's study, found that fourth grade boys and girls labeled more school objects "girl" than "boy", and he concluded that in general, school objects were viewed as feminine by fourth grade students.

Hill, Hubbs, and Verbal, (1974), looked at these differences revealed in Kagan's and Kellogg's studies for grades kindergarten, second, and fourth. They found that most kindergarten girls were unsure who used certain school objects the most while boys at the same level said they did. By second and fourth grade, the girls said that they used the objects the most. Boys agreed that girls used them the most in second grade but were evenly divided in their responses by fourth grade.

Researchers in these three studies, (Kagan, 1964, Kellogg, 1969, Hill, Hubbs, Verbel, 1974), inferred that, because many school objects are more likely to be labeled feminine than masculine by boys and girls in kindergarten through the fourth grade, girls may be more motivated to perform well in school because they view school as sex-appropriate. Consequently, girls achieve generally superior academic success over boys during the primary years of elementary school. These researchers viewed the identification of school objects as an indication of
motivation toward school and as a significant mediating variable related to achievement. However, none of these studies included a measure of motivation to confirm the sex-related classifications as an index of motivation toward school. Also, no achievement data were compared with levels of motivation to support the inferred relationships.

Haefele and Berning, (1979), looked at motivation level and its relationship to the classification of school-related objects as masculine or feminine. They found that girls who comprised the Most Motivated Group in Kindergarten through sixth grades classified more school objects as feminine than subjects in the other three motivation groups. The data showed the next motivational group with the highest frequency of feminine labels was the Least Motivated Girls. The predicted inclination of Low Motivated Boys to associate feminine labels with school objects did not emerge since this motivational group recorded the highest incidence of masculine labels for school objects in grades two through six.

Shulman (1983) measured school motivation and the labeling of school activities (e.g., reads a book, plays a math game) in grades two and six. She did not find a relationship between groups of higher and lower motivated
Figure 2

Major Variables Investigated

ATTITUDES

Toward School Activities

ACHIEVEMENT

Reading
Arithmetic

MOTIVATION

Higher
Lower

GENDER

Male
Female
boys and girls to their labeling of school activities. Analysis of the data did show that all the girls in the second grade and all the boys and girls in the sixth grade, regardless of motivation level, labeled the majority of school activities as feminine.

In summary, the five studies described above indicated that in general, school objects and activities were more likely to be labeled feminine than masculine by boys and girls in the early grades of elementary school (K-4). Boys in those same grades were more ambivalent than girls in their sex-labeling of school objects. Haefele and Berning (1979), showed that a high level of motivation toward school among girls was related to their labeling of school objects as feminine. Shulman's (1983) findings did not support inferences of previous studies which linked motivation toward school with the labeling of school as feminine by boys and girls.

Statement of the Problem

This study was designed to determine the extent of the relationships among the sex of the pupil, academic motivation, attitudes toward school and school activities, ability, and academic achievement, as illustrated in Figure 2. More specifically, the aim of this research was to determine if highly motivated girls exhibited (1) more positive attitudes toward school and school activities and
(2) higher academic achievement than highly motivated boys and likewise, if lower motivated girls exhibited (1) more positive attitudes toward school and school activities and (2) higher academic achievement than lower motivated boys. Furthermore, the study was designed to examine any changes in the major variables (motivational level, attitude, academic achievement) by cross-sectional sampling of subjects in grades two, four, and six.

Significance of the Problem

The purpose of this study was stated in the previous section. A justification for this research, based upon related studies, has been established above. The major point to be emphasized is that in order to conclude, as previous studies have done, that girls are more highly motivated toward school and therefore achieve better academically than boys, motivation and achievement data for both sexes must be examined. In this study, standardized achievement test scores in reading and arithmetic are obtained and these test scores are examined for relationships with known motivational groups.

Studies by Haefele and Berning (1979), and Shulman (1983) that attempted to relate motivation levels to the labeling of school objects and activities have been inconclusive. Therefore, this study replaced school object and activity labeling assessments, used in the
studies just cited, with measures of attitude strength related to subjects' perception of school, rules and regulations, reading activities, and arithmetic activities. These attitude subscales provide a direct measure of boys' and girl's views of the appropriateness of school and school activities and are not used as a proxy for motivation as in previous studies (Kagan, 1964; Kellogg, 1969; Hill, et al., 1974). Students in known motivational groups are rated by their teachers on a one to ten motivational scale where these teachers have had extensive familiarity with their students' motivational behaviors.

A known phenomenon, documented by elementary school educators, is the superior academic performance of girls in the early elementary grades (K-3). This initial superiority of girls' achievement, on the average when compared with boys' achievement, diminishes in the intermediate grade levels (4-6). Studies by Kagan (1964) who examined grades two and three and Kellogg (1969) who examined grade four could not detect these changes due to their limited samples. This study included subjects from grades two, four, and six in order to examine any significant changes in achievement, motivation, or attitude scores across grade levels. Subjects involved in this study were drawn from a cross-section of socio-economic status (SES) levels. Studies
cited earlier used only middle and upper SES population samples. Brophy and Good, (1974), pointed out that "The female sex-role fits the student role nicely, but the sex-role of males, (especially those from lower SES levels), often does not." Therefore, this study makes a significant contribution by comparing subjects from both urban and suburban school populations.

In summary, the significance of the study is supported by the following points:

1. Related studies that have proposed a relationship between motivation and achievement in the elementary school have not supplied data that either measures or empirically links motivation with achievement, (Kagan, 1964; Kellogg, 1979; Hill, et al, 1974).

2. Related studies that have measured motivation and the labeling of school objects and activities have been inconclusive, (Haefele and Berning, 1979; Shulman, 1983).

3. Related studies have not considered the diminishing differential achievement patterns of boys and girls between the early and intermediate grade levels of elementary school.

4. Related studies have examined very limited school populations consisting mostly of middle and upper socio-economic status settings.
CHAPTER II

REVIEW OF RELATED LITERATURE
AND STATEMENT OF HYPOTHESES

Introduction

Previous studies that have examined differences between boys' and girls' labeling of school-related objects and motivation toward school are reviewed in the first part of this chapter. The second section of this chapter explores the concept of motivation and how it differs from the concept of attitudes. In the third section of this chapter studies are reviewed which have explored differential achievement patterns for boys and girls in reading and arithmetic. In addition, the research hypotheses that emerged from the literature review are presented at the end of this chapter.

Labeling Objects and School Motivation

Kagan (1964), as noted in Chapter 1, investigated the sex-role classification of eight school-related objects (viz., blackboard, book, page of arithmetic, pencil, map, school desk, library, school building) to determine
whether children viewed school as masculine or feminine. His sample consisted of two hundred forty second graders and sixty-five third graders. Each subject was taught three nonsense syllables to represent woman (rov), man (dep), and farm (fas). When subsequently shown nineteen test pictures, the subject was to use one of the learned syllables to label each picture. Of the pictures, eight were related to school and contained no gender cues. Results revealed that the eight school-related pictures were classified more frequently as feminine than masculine by second graders, especially girls. Kagan suggested that since the majority of second grade girls viewed these school objects as feminine rather than masculine, and boys also viewed school objects as feminine, then school activities were in more agreement with the female sex-role. He then went well beyond his data which uncovered this pattern of classification of school objects and concluded that girls are more motivated to perform well academically since they view school as more sex-appropriate than do boys. No data related to the measurement of motivation or academic achievement were included in the study.

In a similar study, Kellogg (1969) stated that Kagan's study should be replicated to see if the findings are generalizable. He also asked why the
subjects needed to learn nonsense syllables for the objects, noting that this might produce inaccurate data about the subjects' categorization of school-related objects. His approach was to ask subjects directly to indicate on a questionnaire whether they believed the same eight school-related objects selected by Kagan were used more by girls or boys. Using forty-seven fourth graders (twenty-seven girls and twenty boys), each subject was given a typed list of twenty-four common objects including eight school-related objects and told to check the "boy" or "girl" column as the teacher identified each object on the list. The subjects had been told that some of the objects were used more by boys than girls and some used more by girls than boys. Kellogg did not reveal which objects were more frequently used by either sex. Of the twenty-four items which had been randomly mixed on the lists, eight were more traditionally appropriate for boys, eight more traditionally appropriate for girls and eight related to scholastic activities. Results showed that boys and girls judged four of the school-related objects as most used by girls and two of them most used by boys, while two of them were not assigned to girls or boys by either group. On the basis of these data and no additional evidence related to motivation or achievement, Kellogg inferred, as had Kagan, that girls' perceptions of school objects were more congruent with their sex-role and
that girls were more highly motivated toward academic activities and, therefore, would be the higher achievers.

Hill, Hubbs and Verble (1974) took the research of Kagan and Kellogg one step further and looked for developmental differences among three grade levels in the classification of school-related objects. They hypothesized that there would be differences in labeling between kindergarten, second grade and fourth grade. Using forty-eight randomly selected subjects with an equal number of boys and girls from kindergarten, second grade, and fourth grade, seventeen pictures were randomly shown to each subject. Each child was then asked, "Who uses it - a boy, or a girl?", or "Who uses it most?" if there was no response to the first question. Of the seventeen pictures, ten of the objects were associated with school objects (e.g., desk, book, blackboard), three were most often associated with girls (e.g., doll, purse), and four were most associated with boys (e.g., truck, gun, blocks). Results showed that kindergarten girls were unsure about who used the school-related objects. However, by second grade and on into fourth grade, girls said that most of the school objects were used more often by girls. On the other hand, kindergarten boys thought that boys used school objects more often than girls. By second grade, they responded that girls used school objects the most.
Fourth grade boys thought an equal number were used by boys and girls. Hill, et al. concluded that these results clearly show that girls perceive school as sex appropriate, that is, as congruent with their sex-role. These findings showing that girls viewed school as more congruent with their own sex-role and that boys were more ambivalent, support Kagan's and Kellogg's conclusions. Like Kagan and Kellogg, Hill, et al., assumed they were measuring motivation toward school, yet failed to administer either a measure of motivation or achievement. Therefore, their conclusions linking motivation and achievement lack empirical support. In all three studies, selection or classification of objects was incorrectly interpreted as a proxy for school motivation.

An unpublished study by Haefele and Berning (1979) attempted to validate the conclusions of Kagan (1964) that girls are more motivated to master academic tasks than are boys because they view school objects and activities as congruent with their sex-role. The study explored relationships among motivational level, sex of the subject and classification of school-related objects with 443 subjects in kindergarten through sixth grade. A motivation toward school instrument was administered and an analysis of variance test was subsequently conducted that compared four motivational groups (viz., higher
motivated girls, higher motivated boys, lower motivated
girls, and lower motivated boys). Results revealed no
significant differences among the four groups. There
did exist a difference between the two motivational levels
(i.e., higher, lower) when all the most motivated boys and
girls were compared with all the least motivated boys and
girls (F = 3.05, P = .05). Furthermore, analysis of the
data furnished by subjects in grades four through six
indicated no significant difference in the number of
school-related objects designated male (\(x = 36.4, \text{df} = 36\))
or female (\(x = 30.5, \text{df} = 36\)) across all four
motivational groups. In addition, no significant
differences were observed when all boys' classifications
were compared with all girls' classifications of school
objects into boy or girl categories. Additional
investigation of data across grade levels one, two, and
three did reveal that higher and lower motivated boys
displayed a marked change in labeling behaviors at the
second grade level, classifying more school objects male
than female. This early grade shift was inconsistent with
previous data from studies by Kagan (1964), Kellogg (1969)
and Hill, et al. (1974) which showed second grade boys
labeling most school objects as feminine. The latter
three studies also revealed that girls in grades two,
three and four consistently labeled more of the objects as
feminine or sex-appropriate while boys labeled more of the objects as feminine or sex-inappropriate. These findings were unconfirmed by the findings of Haefele and Berning (1979).

Shulman (1983), in an unpublished thesis, explored the relationships among level of motivation toward school, sex of the subject and classification of school-related activities. Two hypotheses proposed by Shulman were a) higher motivated boys in second and sixth grades will classify significantly more of the forty-five school-related activities as masculine and will show higher academic achievement than the lower motivated boys, and b) lower motivated girls in second and sixth grade will classify significantly more school-related activities as masculine and will show lower academic achievement than the higher motivated girls. Her sample consisted of fifty-two second grade subjects, and eighty-seven sixth grade subjects. Unique to Shulman's study was a list of forty-five school-related activities that measured the degree to which boys and girls perceived school activities as appropriate for boys and girls. Data reported by Shulman (1983) did not confirm her hypotheses. That is, less motivated boys in second and sixth grades classified significantly more school-related activities as masculine than did the more motivated boys. No measure of academic performance was administered in the study. In summary,
hypotheses made by Shulman (1983) about boys and girls in the second and sixth grades linking motivation toward school with the labeling of school activities were unsupported. Recommended by Shulman was the study of elementary students' standardized academic achievement test scores in conjunction with their assessed motivational levels. Also recommended was a longitudinal or cross-sectional study to determine if motivation toward school scores and the classification of school related activities as masculine or feminine represented stable characteristics of boys and girls over time and across grade levels.

Academic Motivation and Attitudes

The term motivation, although frequently used in the earlier studies presented above, is either undefined by the researchers or derived from association between object labels and the sex of the child who is asked to classify the objects. A cause-effect relationship between academic motivation and academic achievement is inferred in each of the three earlier studies without supporting data, (Kagan, 1964; Kellogg, 1969; Hill et al., 1974). Instead of measuring students' academic motivation, all the studies reviewed in the previous section of this chapter measured attitudes which are not
highly correlated with academic achievement (Fraser, 1978; Cattell, Barton, and Dielman, 1972).

Mead's (1977) definition of an attitude as "...a predisposition to act..." noted in Chapter I was a narrower definition than expressed earlier by Shaw and Wright (1967) who stated: "Attitudes are...affective reactions based upon evaluative concepts or beliefs which have been learned about the characteristics of a social object or class of social objects." (p. 3) This definition of attitudes further clarifies the concept measured by object labeling studies. Researchers attempting to infer academic motivation from subjects labeling of school-related objects were measuring attitudes. In fact, their data simply report measures of attitudes toward social objects found in and related to school. Mead's and Shaw and Wright's definitions of attitudes are consistent with others' understanding of the term (e.g. Fisher, 1977; LeFrancois, 1985).

The inter-relationship between attitude and motivation can be understood from the following short excerpt: "The [attitudes]...therefore represent the underlying dispositional or motivational urge" (Gage, 1965, p. 17). Attitudes may simply represent an urge or intention to master academic tasks which may not be carried to completion or in some cases even begun. Positive or negative attitudes do not necessarily
predict academic achievement. A large body of literature which suggests that attitudes are not always consistent with behavior (Deutscher, 1973; Fishbein & Ajzen, 1975; Schuman & Johnson, 1976) supports this point.

The following illustration further clarifies the possible inconsistency between self-expressed attitude and behavior:

Two students (A and B) indicate on an attitude questionnaire that they both think reading is great fun—they like it ten on a one to ten scale.

These two students could be very differently motivated in terms of reading and reading achievement which only their classroom teacher could detect. For example, student A could be observed choosing novels to read, reading during recess time, and taking books home. Student B could be observed choosing mostly picture books or not finishing book reports, and not taking books home.

Academic motivation is defined in this study as an internalized, complex construct that may significantly affect students' abilities and academic achievement (Frymier, 1974).

The present study uses teachers' assigned ratings (TA) of student behaviors to assess individual student's academic motivation on a scale of one (low) to ten (high). While previous studies inferred motivation from attitudes based upon students' object labeling (i.e., Kagan, 1964) or from an attitude questionnaire (Haefele, Berning, 1979), academic motivation levels in this study were based
upon observations by teachers of their students throughout most of a school year (seven months). An observational technique, as was used by teachers in this study to rate motivational levels is implied by Frymier's model of academic motivation (Frymier, 1974, see Appendix F). This model was not presented to teachers prior to their rating students' motivation. Only general remarks were made regarding student behaviors that might indicate positive or negative school motivation (see Appendix E, Instructions to Teachers).

**Differential Achievement in Reading and Arithmetic**

More than 70 years ago, Ayers (1909) expressed concern for the lower reading achievement and greater incidence of reading problems among boys. Concern more recently has increased as evidenced in such volumes as *Reading Rights for Boys* (Austin, Clar, and Fitchett, 1971) and *The Feminized Male* (Sexton, 1970). The latter volume documents numerous instances taken from classroom observations of boys and girls particularly in the early grades where boys are expected to conform, sit still, be quiet, and be neat. All these characteristics were more traditionally considered appropriate for little girls than for little boys. The incongruity of demands made upon boys in school compared to those at home or in the community Sexton contends, jeopardizes boys' early
education. However, the same demands made upon girls seem to conform to their own sex-role expectations and expectations of others with the effect of enhancing girls' early education.

Numerous studies within the United States have shown that though there are few sex differences in general intelligence or ability, girls tend to outperform boys in reading and verbal skills (Asher and Gottman, 1973; Gates, 1961; Maccoby, 1966; National Assessment of Educational Progress, 1972, 1976). These studies have found boys in the middle grades (4-6) to be from one third to one half a grade level behind girls in reading. Also, boys are more frequently referred for remedial reading and are more frequently diagnosed as having reading or learning disabilities (Blom, 1971). Moreover, girls' greater achievement in reading and verbal skills persists into high school and beyond (Backman, 1972; Droege, 1967).

More recent studies on verbal and quantitative abilities have found similar patterns of sex-differences in academic achievement. Dwyer (1974) investigated school children from grade two to grade twelve on standardized achievement batteries. Achievement proved to be more a function of the child's perception of these subjects as sex-appropriate or sex-inappropriate (sex-role preference) than of the child's own sex, the individual's assessment of his own "masculinity" or "femininity" (sex-role
identity), or personal liking or disliking (attitudes) for reading and arithmetic. In another study (Fitzpatrick, 1978), the achievement of bright 10th grade girls in mathematics, as assessed by both grades and standardized tests, was significantly related to the students' attitudes toward various aspects of the female role. Those girls showing a more liberal orientation on the women's role scale performed better in mathematics than did those with more traditional attitudes.

Fox, Brody, and Tobin (1979-1980) have written extensively on the sources of sex differences in mathematics performance, drawing in part on a long-term project with mathematically precocious youth. Sex differences in mathematics aptitude tests were greatly reduced when the number of mathematics courses taken was controlled. However, males and females with the same initial tested ability in mathematics function differently with regard to subsequent course selection, course attrition, and acceleration. Although some of these course taking differences result from external pressure, personal choice significantly affects the decisions. Conspicuous sex differences in mathematics interests and attitudes, as well as performance, begin to appear by the seventh grade (Anastasi, 1958).

Recent surveys of the research on sex differences in reading and arithmetic achievement among school children
suggest that more than one hypothesis may be needed to account for achievement differences (Bank, Biddle, and Good, 1980; Nash, 1979). The feminization of reading hypothesis has attracted much research and suggests that teachers and students view certain subjects as masculine and others as feminine. "On the basis of available data, this hypothesis seems to offer a promising approach to the understanding of differential reading achievement....and (it suggests) that student achievement levels depend on the sex appropriateness of the task at hand" (Bank, et al., 1980). Direct support for the feminization hypothesis has been provided by Stein and Smithells (1969), who found that pupils viewed reading as a feminine task while mathematics was seen as a masculine task.

Data are available to suggest that boys achieve better on curriculum problems that are directly related to sex role interest and do more poorly on those that are at odds with sex role interests (Christopolos & Borden, 1978). Dwyer (1974) found that American boys who were doing more poorly in reading were also more likely to associate reading with feminine activities, and Gross (1967) found that Israeli students' perceptions of the sex role appropriateness of reading did predict achievement. Similar findings have been reported in mathematics by Snead and Chase (1977).
The femininity of reading or the masculinity of mathematics, as perceived by students, is indirectly explored in the research hypotheses of this study. Sex of the subject is maintained as a variable for analysis across attitudes, motivational levels, and the academic subjects of reading and arithmetic. Also, the potential of attitude and motivational variables to account for differential academic achievement is found in the current literature in predictive models. Neale (1969) reports that attitude, personality, and ability each account for about 25 percent of the variance in mathematics achievement. Cattell, Barton, and Dielman (1972) found that personality, ability, and a motivational variable each accounted for 20 to 25 percent of the variance in school achievement. A study by Zigler and Butterfield (1968) shows that motivation can make a direct, independent, causal contribution to achievement. Zigler and Butterfield hypothesized that standardized testing procedures tend to yield an underestimate of I.Q. scores of culturally deprived nursery school children. They hypothesized that testing for I.Q. under conditions that optimized motivational factors should significantly raise a child's I.Q. score. I.Q. scores were compared under standard and optimal testing conditions at the beginning and at the end of a nursery school year for nursery and non-nursery school children. Although there was no
increase in I.Q. scores from the beginning of the year to the end for any group tested under optimal conditions, the I.Q. scores under the standard condition increased, but only for the students enrolled in nursery school.

Other studies have shown motivational factors to have an indirect influence on achievement (Kohn and Rosman, 1973).

Another interpretation of the effect of motivation on achievement holds that motivational characteristics as well as self-concept and self-esteem, are themselves sharpened by a student's history of success and failure in and out of school. Studies by Kifer, 1975 and Bridgeman and Shipman, 1978 concluded that achievement in the school setting is an antecedent to motivation and perhaps other personality characteristics.

Research Hypotheses

The following research hypotheses are supported in the literature review or are suggested by this review and are as yet untested.

H1 - There are significant relationships among teacher assigned (TA) motivational ratings, sex of the subject, and achievement test scores in reading and arithmetic.
Hypothesis one is suggested by the literature review but has not been tested by any single study. Studies by Neale, 1969; Barton and Dielman, 1972; Zigler and Butterfield, 1968 establish a relationship between attitudes and achievement but do not measure academic motivation. Relationships between sex of the subject and differential achievement in reading and arithmetic were established by Asher and Gothman, 1973; Gates, 1961; Maccoby, 1966. No studies reviewed have measured academic motivation nor established relationships between academic motivation, sex of the subject and academic achievement in the early grades.

H2 - There is a significant relationship between the academic motivational rating assigned by the teacher (TA) and scales measuring attitudes, (1) toward school, (2) toward rules, (3) toward reading, and (4) toward arithmetic.

Hypothesis two explores attitude relationships using four subscales with sex of the subject and academic motivation level. Studies have not shown a significant relationship between attitudes and achievement (Fraser, 1978; Cattell, et al., 1972) but have suggested a relationship between attitudes and motivation (Neale, 1969; Cattell, et al., 1972). Results from the analysis of hypothesis two will clarify the relationships between
motivation level, sex of the subject, attitudes, and achievement.

H3 - There are significant relationships between the sex of the subject and the subject's attitudes (1) toward school, (2) toward rule following, (3) toward reading and (4) toward arithmetic.

The relationship between the sex of the subject and attitudes toward school was explored in studies by Kagan, 1964; Kellogg, 1969; Hill et al., 1974 where positive attitudes were inferred from subjects' labeling of school-related objects as sex-appropriate. Support for these inferences was provided by Sexton, 1970 who noted that in general girls adjust to the school environment more easily than boys - particularly at a young age (5 years - 13 years). Bank, et al., 1980; and Stein and Smithells, 1969 also found attitudes toward school subjects and academic achievement as they related to the gender of the pupil to favor females. One would therefore expect elementary school girls to exhibit more positive attitudes toward school and academic subjects than do boys.

H4 - There is not a significant relationship between the total of the school attitude factors (TAM) and achievement test scores in reading and arithmetic.
Hypothesis four combines all attitude sub-scores for factors AT1-AT4 together into a total attitude toward school measure (TAM) and explores the relationship between total attitude and achievement in reading and arithmetic. Literature summarizing numerous studies (Legion, 1977; Schock, 1973; Wilson, 1980) of the school attitude-achievement relationship across grades K-12 in a variety of subject areas, found that the correlation between these factors was negligible or non-existent.

H5 - There is not a significant relationship between achievement test scores in reading and arithmetic and sub-scores measuring attitudes toward (1) school, (2) following school rules, (3) reading, and (4) arithmetic.

Hypothesis five is an extension of H4 which looks more specifically at attitudes directly related to the subjects for which achievement scores were obtained.

H6 - There is a significant relationship between teacher rated ability in reading (RD) and arithmetic (AR) and achievement test scores in reading (R) and arithmetic (A).

The direction of hypothesis six is derived from the literature pertinent to the previous hypothesis (H4).
Hypothesis six is proposed to determine the degree to which ability may intervene to bring about differential achievement in reading and arithmetic. Ability ratings were done in a subjective manner by teachers where each student was rated in reading and arithmetic on a one (low) to ten (high) ability scale.
CHAPTER III

PROCEDURES

In this chapter, information is presented concerning the selection of the sample population, description of the population, and development and administration of the instruments used in this study.

Selection of the Sample

The population for this study consisted of subjects from three elementary schools in grades two, four, and six. There were 160 boys and 136 girls from twelve second grade classrooms, 75 boys and 75 girls from six fourth grade classrooms, and 142 boys and 146 girls from eleven sixth grade classrooms. The total population contained 734 subjects or 377 boys and 357 girls. From this population, a sample of 232 boys and girls was selected from grade levels two, four, and six by twenty-nine teachers. These teachers nominated two boys and two girls who were highest in motivation toward school and two boys and two girls who were lowest in school motivation. Teacher nominations were based upon the teacher's
knowledge of the students' characteristic behaviors throughout the year where the teacher had extended knowledge of the pupils' positively and negatively motivated behaviors during academics and other behaviors. The two groups of boys and girls, nominated as highest and lowest in motivation, were shown to be statistically different than the population (734 subjects). This analysis compared the total population with the highest motivated boys and girls in the first comparison and with the lowest motivated boys and girls in the second comparison. A loss of seventy-five subjects from the original sample resulted in a target sample consisting of 157 subjects. This loss of subjects was due to a decision to limit the statistical analysis of data to only those subjects in the sample for whom complete records of achievement test scores were available. The t-test was calculated on measures of attitudes toward school and school activities and revealed significant differences between the higher and lower motivated groups and the population respectively ($t = 2.82\ p = .004$, $t = -5.13$, $p = .0001$, see Table 1.).

Description of the Population

The three elementary schools from which the subjects were drawn are located in or just outside a major midwestern metropolitan area. The two city elementary
Table 1

T-test Comparing Higher Motivated
and Lower Motivated Groups on School Attitudes

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>T</th>
<th>D.F.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher</td>
<td>106</td>
<td>3.23</td>
<td>.48</td>
<td>5.23</td>
<td>196</td>
<td>.0001</td>
</tr>
<tr>
<td>Lower</td>
<td>92</td>
<td>2.89</td>
<td>.43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher</td>
<td>106</td>
<td>3.23</td>
<td>.48</td>
<td>2.82</td>
<td>722</td>
<td>.004</td>
</tr>
<tr>
<td>Rest*</td>
<td>618</td>
<td>3.0</td>
<td>.45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>92</td>
<td>2.89</td>
<td>.43</td>
<td>-5.13</td>
<td>722</td>
<td>.0001</td>
</tr>
<tr>
<td>Rest</td>
<td>632</td>
<td>3.15</td>
<td>.45</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n = 724

*Rest - signifies the total sample minus the motivational group indicated.
schools in the study drew their students from the same city school population. One school included all primary level students (K-3) while the other school included all intermediate level students (4-6). The suburban elementary school included students in both the primary and intermediate grades. Information contained in annual reports by the principals from each school indicated the minority composition in the city schools ranged from 49 percent to 67 percent. Low income families made up approximately 62 percent of the city school families. Low income families were defined as those receiving free or reduced price lunches. In the suburban school, the minority composition of the school population was reported to be less than 6 percent. Economically deprived families were reported to make up 3 percent of the school population.

The 734 subjects who participated in the first phase of this study represent the broad population just described. The target sample of 157 subjects represents only those boys and girls who were selected according to a specific criterion; they were selected by the subjective judgment of their teacher because they possessed motivational characteristics toward school that were either higher or lower than the motivational characteristics of the majority of other students in each classroom from which they came.
**Instrumentation**

Two questionnaires were designed and administered by the researcher to all 734 subjects in the population. These instruments were called The Attitude Toward School Scale (ATSS) and The School Related Activities Scale (SRAS). A third questionnaire called The Student Rating Sheet (SRS) was designed by the researcher to gather motivation and ability ratings for a sample of 232 subjects selected by their teachers as highest or lowest in school motivation.

The Attitude Toward School Scale was designed to measure the subject's general attitudes toward school by having the subjects respond to ten positive statements made about school on a Likert type scale (See Appendix A). Following statements such as, "I like to go to school," and "I feel good when I am in school," subjects checked one of four responses - "Nearly Always," "Sometimes," "Seldom," or "Almost Never." Numerical values were assigned to each response choice ranging from four ("Nearly Always") to one ("Almost Never"). The form of the questioning and the response choices on the ATSS were adopted from the Bonney-Meyers Attitude Toward School Scale (BMATSS) published by the American Institute for Research (1972).
The Bonney-Meyers Attitude Toward School Scale was developed from a survey of other similar attitude scales, classroom observations, and analysis of questionnaire responses obtained from 120 fifth and sixth grade pupils who stated how they felt about various aspects of the school situation. Reliability of the BMATSS was reported as .89 and .86 with fifth and sixth grade students respectively. A factor analysis of the forty-seven questions on the BMATSS revealed twelve categories of questions that specifically grouped students' attitude toward school statements. A panel of independent judges (commissioned by the American Institute for Research in 1972) labeled these subgroups of statements with a pertinent attitude construct. The factor or construct of particular significance to this research study was Factor One labeled "Likes School". This factor consisted of six questions that were significantly associated with each other by the factor analysis. These six questions pertaining to the construct "Likes School" were adopted for use on the ATSS to measure general school attitudes. Four additional questions, two pertaining specifically to attitudes toward reading and two pertaining specifically to attitudes toward arithmetic were added to the ATSS scale, with the final ATSS consisting of ten questions.

The content validity of the ATSS was partially established by adopting the majority of questions and
questioning format from an instrument of known validity - the BMATSS. Construct validity was established through a factor analysis of all ten questions on the ATSS for 734 subjects who completed the survey. Five questions on the ATSS had a combined factor loading of .59 and were identified as measuring the construct "Likes School." Additional support for the construct validity of the ATSS is established through the use of the comparison of known groups method (Gronlund, 1985). Higher and lower motivated students were the known groups and a significant difference between these groups' mean scores on the ATSS was observed (t = 5.2, p = .0001).

The School Related Activities Scale was designed to measure the subjects' attitudes toward more specific school activities. Fifteen school-related activities were listed following the sentence stem, "This is how I feel in school when....". Subjects indicated the strength of their positive or negative attitudes about these activities on a Likert type scale (See Appendix B).

The School Related Activities Scale is an adaptation of the School Related Activities Instrument (SRAI, Shulman, 1983). The SRAI was designed to assess how often boys or girls engaged in certain school activities. Forty-five school-related activities were classified into four categories as follows: academic, playground, rules and regulations, and helping. The adapted SRAS questionnaire
used in this study included activities from each category with the majority of the activities taken from those under the category of academic activities. An example of the attitude statements on this adapted scale is, "This is how I feel in school when reading a book." Subjects chose one of the following responses, "VH" (Very Happy), "H" (Happy), "U" (Unhappy), "VU" (Very Unhappy). The construct validity of the SRAS was established through a factor analysis supplied by the population of 734 subjects (see Appendix E). Questions from the SRAS clustered together indicating significant associations within three constructs. These constructs became subscales which measured (1) "Likes to Follow Rules", (2) "Likes Reading", and (3) "Likes Arithmetic". The SRAS contained an insufficient number of questions from categories, helping or playground (on the SRAI) for those questions to cluster and be identified as independent factors after analysis. The two subscales related to academic activities, likes reading and likes arithmetic, represented six questions with mean factor loadings of .50 and .75 respectively. The third scale on the SRAS, likes rules, had a mean factor loading of .59 for four questions related to rule following. The fact that rule following became a subscale on the SRAS was consistent with conditions inherent in the typical school setting. Only those questions that loaded significantly ( .35) on the
major four factors, as determined by the SPSSX Varimax factor analysis, were used in the final data analysis procedures (see Figure 3).

The Student Rating Sheet was designed to rate subjects' motivational and ability levels (See Appendix C). These questionnaires were completed by each of the twenty-nine teachers whose classes participated in this study. Instructions for completing these rating sheets were discussed with the participating teachers during an orientation meeting. Examples of positively and negatively motivated school behaviors were given. These examples constituted the operational definition by which teachers were expected to judge the motivational levels of their students. Ability ratings were not discussed or illustrated during this meeting because of teachers' clearer understanding of this concept. Only the 232 higher and lower motivated subjects nominated by their teachers were rated on the SRS. These subjects were rated on three ten-point scales according to their teacher's knowledge of their general school motivational characteristics and abilities in reading and arithmetic (see Appendix D). Teachers completed the SRS and returned them to the researcher following his administration of the two attitude surveys in their classroom.

Raw scores from standardized reading and arithmetic achievement tests were obtained for all subjects in the
**FIGURE 3**

Results of Factor Analysis of Questionnaires
Measuring Strength of Attitudes Toward School
and School Activities

<table>
<thead>
<tr>
<th>Principal Factor</th>
<th>Statements Measuring Strength of Attitude</th>
<th>Loading of Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor I Likes School</td>
<td>A. I like to go to school.</td>
<td>.70*</td>
</tr>
<tr>
<td></td>
<td>B. During school hours I'd rather be in school than anywhere.</td>
<td>.64</td>
</tr>
<tr>
<td></td>
<td>C. When I am in school, I feel good.</td>
<td>.62</td>
</tr>
<tr>
<td></td>
<td>D. My school work is interesting.</td>
<td>.51</td>
</tr>
<tr>
<td>Factor II Likes Following Rules</td>
<td>This is how I feel in school when:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. keeping desk neat</td>
<td>.69</td>
</tr>
<tr>
<td></td>
<td>B. following playground rules</td>
<td>.59</td>
</tr>
<tr>
<td></td>
<td>C. working without talking</td>
<td>.57</td>
</tr>
<tr>
<td></td>
<td>D. raising my hand before speaking</td>
<td>.51</td>
</tr>
<tr>
<td>Factor III Likes Reading</td>
<td>A. I feel good when it is time to read.</td>
<td>.45</td>
</tr>
<tr>
<td></td>
<td>B. I like to learn from books.</td>
<td>.35</td>
</tr>
<tr>
<td></td>
<td>This is how I feel in school when:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. working on science</td>
<td>.45</td>
</tr>
<tr>
<td></td>
<td>D. answering questions</td>
<td>.45</td>
</tr>
<tr>
<td></td>
<td>E. reading a book</td>
<td>.35</td>
</tr>
<tr>
<td>Factor IV Likes Arithmetic</td>
<td>A. I like to do arithmetic problems.</td>
<td>.77</td>
</tr>
<tr>
<td></td>
<td>B. I feel good when doing arithmetic.</td>
<td>.74</td>
</tr>
<tr>
<td></td>
<td>This is how I feel in school when:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. working on arithmetic</td>
<td>.35</td>
</tr>
</tbody>
</table>

* Only statements achieving numerical values (loadings) of .35 significance or greater are indicated here.

** This sentence stem indicates questions from questionnaire two - SRAS. All other statements appeared on questionnaire one - ATSS.
target sample of 157 subjects. Raw scores for subjects' performance on the California Achievement Test or the Iowa Test of Basic Skills were analyzed and compared after all scores were converted to Z-scores ( (raw scores-mean)/sd).

Administration of the Instruments

The researcher administered the Attitude Toward School Scale to all self-contained classroom groups of second, fourth, and sixth grade subjects. Second and fourth grade subjects completed the questionnaire by responding to each question after it was read aloud by the researcher. Sixth grade subjects responded to the questions independently after all questions were read by the researcher. Directions for completing the instrument were read from the questionnaire to provide consistency in administration.

Subjects were told that they were a part of a study about how students felt about school. It was emphasized that there were no right or wrong answers and that their teachers would not know how they answered the questions. The researcher read each question while waiting for the second and fourth grade subjects to respond. As an additional aid for the second grade subjects, four faces were drawn on the chalkboard in each classroom to represent the symbols "VH", "H", "U", and "VU". Children
were given the opportunity to draw these faces on their paper above the letter symbols. Sixth grade subjects, as before, waited until all questions were read and then completed the scale independently.

Both instruments were given in one session which took approximately twenty to thirty minutes in the primary classes (K-3) and fifteen to twenty minutes in the intermediate classes (4-6).
CHAPTER IV

ANALYSIS OF THE RESULTS

Statement of the Problem

This study was conducted to determine the extent of the relationships among the sex of the pupil, academic motivation, attitudes toward school, ability, and academic achievement. Three questionnaires were administered to collect the data described in Chapter III, (1) the Attitude Toward School Scale, (2) the School Related Activities Scale, and (3) the Student Rating Sheet. Standardized achievement test scores in reading and arithmetic were obtained for all subjects in the target sample where available.

Presentation of the Findings

Six primary research hypotheses are presented in numerical order (H1-H6) with accompanying data tables. Data regarding these hypotheses were analyzed to identify the influence of the independent variables of sex, motivation, attitudes, and ability on the dependent variable of achievement. Other results from data
collected by grade in the urban and suburban school settings, are also reported. Table 2 presents labels and definitions for all the variables appearing in this paper.

Table 2

**VARIABLE LABELS AND DEFINITIONS**

1. MOT - Motivation groups: higher motivated, lower motivated
2. TA - Motivation rating assigned by teachers between 1 (low) and 10 (high)
3. Sex - Boys (1) and Girls (2)
4. ZR - Z scores for reading achievement calculated from raw score achievement data
5. ZA - Z scores for arithmetic achievement calculated from raw score achievement data
6. ZT - Total of ZR and ZA
7. AT1 - Attitude scale related generally to school
8. AT2 - Attitude scale related to rule following
9. AT3 - Attitude scale related to reading
10. AT4 - Attitude scale related to arithmetic
11. TAM - Total attitude measure (AT1 + AT2 + AT3 + AT4)
12. RD - Reading ability rating assigned by teachers between 1 (low) and 10 (high)
13. AR - Arithmetic ability rating assigned by teachers between 1 (low) and 10 (high)
14. TOT - Total of RD and AR
15. GR - Grade level 2, 4, or 6
Research hypotheses presented in this chapter have not been restated in the statistical null hypothesis form. Such restatement would have resulted in four negatively stated hypotheses and two positively stated hypotheses. Not all hypotheses emerged from the literature as positive statements, so confusion is avoided by excluding statistical hypotheses in this chapter.

H1 - There are significant relationships among teacher assigned motivational ratings (TA), sex of the subject, and achievement test scores in reading (ZR) and arithmetic (ZA).

Data related to hypothesis one were analyzed through two statistical procedures which tested for significant relationships. Pearson product-moment correlations were calculated first followed by a one-way analysis of variance (ANOVA).

Table 3 shows that there is no relationship at all between sex of the subject and achievement in reading, achievement in arithmetic, and total achievement (the sum of the two previous achievement scores). These nominal correlations did not even approach the required .05 level of significance. Neither is there a significant correlation between sex of the subject and teacher assigned motivational ratings (TA). There are significant and substantial correlations between TA
and (1) academic achievement in reading, $r = .590$, (2) arithmetic, $r = .570$, and (3) total achievement, $r = .616$. These substantial correlations all reached statistical significance beyond the .01 level of probability. Hypothesis one is partially supported by the significance of the Pearson correlation coefficients between TA and achievement data. Increases in teacher assigned motivational ratings were accompanied by increases in reading and arithmetic achievement test scores.

Table 3

Pearson Product-Moment Correlations
Between Sex, Teacher Assigned Motivation (TA) And Achievement in Reading (ZR) and Arithmetic (ZA)

<table>
<thead>
<tr>
<th>Achievement</th>
<th>TA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Read.</td>
</tr>
<tr>
<td>Sex</td>
<td>.017</td>
</tr>
<tr>
<td>p</td>
<td>.83</td>
</tr>
<tr>
<td>TA</td>
<td>.590</td>
</tr>
<tr>
<td>p</td>
<td>.00</td>
</tr>
</tbody>
</table>

n=157

Further analyses, using one-way analysis of variance (ANOVA) procedures, confirmed the relationships between motivation group (higher motivated boys (HB), higher motivated girls (HG), lower motivated boys (LB), or lower motivated girls (LG)) and achievement (Table 4). No relationship was disclosed between motivational subgroup and achievement.
Two measures of motivation were obtained. On one measure (TA), teachers rated student motivation from 1 to 10 and on the other they assigned students to dichotomized motivation groups either high or low (MOT). The correlation between these two measures of motivation was very substantial, r = .86. The results of analyses using the second motivation measure facilitated the ANOVA analysis presented in Table 4.

Table 4

One-Way Analysis of Variance
Achievement by Motivation Subgroup

<table>
<thead>
<tr>
<th></th>
<th>SUM OF SQS</th>
<th>DF</th>
<th>MEAN SQ</th>
<th>F</th>
<th>SIG OF F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HB</td>
<td>0.62</td>
<td>0.50</td>
<td>-.76</td>
<td>-.82</td>
<td>74.904</td>
</tr>
<tr>
<td>HG</td>
<td></td>
<td>3</td>
<td>24.968</td>
<td>45.911</td>
<td>.000</td>
</tr>
<tr>
<td>LB</td>
<td></td>
<td>3</td>
<td>87.835</td>
<td>46.064</td>
<td>.000</td>
</tr>
<tr>
<td>LG</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Arithmetic Achievement |          |    |         |       |         |
| HB       | 0.63       | 0.48 | -0.55  | -0.78 | 57.870  |
| HG       |            | 3   | 19.290  | 29.824| .000    |
| LB       |            | 3   |         |       |         |
| LG       |            | 3   |         |       |         |

| Total Achievement |          |    |         |       |         |
| HB       | 1.25       | 1.06 | -1.31  | -1.60 | 263.504 |
| HG       |            | 3   | 87.835  | 46.064| .000    |
| LB       |            | 3   |         |       |         |
| LG       |            | 3   |         |       |         |
Significant relationships revealed in the preceding correlational analysis were substantiated through the application of ANOVA procedures. The higher motivated group received the higher achievement scores in reading and arithmetic \((F=139.72, \ p=.000)\), while the lower motivated group received the lower achievement scores in reading and arithmetic \((F=87.190, \ p=.000)\). The combined achievement scores for reading and arithmetic are highest for the higher motivational group and lower for the lower motivational group \((F=137.722, \ p=.000)\). Hypothesis one is partially supported by significant \(F\) values for relationships between motivational group and achievement. Sex was not found to be a significant variable related to either motivation or achievement in the ANOVA or correlational analysis.

\(H2\) - There is a significant relationship between the academic motivational rating assigned by the teacher (TA) and subscores measuring attitudes (1) toward school, (2) toward rules, (3) toward reading, and (4) toward arithmetic.

A Pearson product-moment correlation \((r)\) was used to analyze the relationship between teacher assigned motivational ratings (between 1-10) and four attitude factor scores (AT1-AT4).
Table 5 shows statistically significant Pearson correlation coefficients for correlations between TA and school attitude scales 1 through 4. A positive attitude toward arithmetic (AT4) was moderately correlated with teachers' motivational ratings (r=.37). A positive attitude toward school (AT1) was also moderately correlated with teachers' motivational ratings (r=.36). Low, albeit significant correlations were revealed between ratings of motivation and attitudes favorable to reading (AT3, R=.23) and following school rules (AT2, r=.21). In each case, higher (positive) ratings on the motivation scale predicted higher (positive) scores on the four attitude scales, all significant beyond the .01 level of confidence.

Table 5

Pearson Product-Moment Correlations Between Attitude Scales (1-4) and Motivational Ratings (TA)

<table>
<thead>
<tr>
<th></th>
<th>AT1</th>
<th>AT2</th>
<th>AT3</th>
<th>AT4</th>
</tr>
</thead>
<tbody>
<tr>
<td>TA</td>
<td>.3611</td>
<td>.2129</td>
<td>.2334</td>
<td>.3725</td>
</tr>
<tr>
<td>p</td>
<td>.000</td>
<td>.007</td>
<td>.003</td>
<td>.000</td>
</tr>
</tbody>
</table>

Hypothesis two is confirmed by the data presented in Table 5. The correlations between teacher assigned motivational ratings and attitude factors (AT1-AT4) are low to moderate and statistically significant well beyond the .05 level of confidence.
H3 - There are significant relationships between the sex of the subject and the subject's attitudes (1) toward school, (2) toward rule following, (3) toward reading, and (4) toward arithmetic.

Table 6 shows attitude scales with mean scores and standard deviations calculated for all boys and girls in the target sample. Also shown in this table is the maximum possible score for each attitude factor.

Table 6

T-test for Significant Differences Between Boys' and Girls' Mean School Attitude Factors (AT1, AT2, AT3, AT4)

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Max.*</th>
<th>Mean Score</th>
<th>Std. Dev.</th>
<th>T</th>
<th>D.F.</th>
<th>2-Tail Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>81</td>
<td>16</td>
<td>14.086</td>
<td>3.705</td>
<td>.232</td>
<td>155</td>
<td>.022</td>
</tr>
<tr>
<td>Girls</td>
<td>76</td>
<td>16</td>
<td>15.382</td>
<td>3.249</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>81</td>
<td>16</td>
<td>11.803</td>
<td>3.223</td>
<td>1.65</td>
<td>155</td>
<td>.101</td>
</tr>
<tr>
<td>Girls</td>
<td>76</td>
<td>16</td>
<td>12.605</td>
<td>2.852</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>81</td>
<td>20</td>
<td>12.654</td>
<td>2.099</td>
<td>0.94</td>
<td>155</td>
<td>.346</td>
</tr>
<tr>
<td>Girls</td>
<td>76</td>
<td>20</td>
<td>12.974</td>
<td>2.135</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>81</td>
<td>12</td>
<td>9.161</td>
<td>2.704</td>
<td>0.29</td>
<td>155</td>
<td>.780</td>
</tr>
<tr>
<td>Girls</td>
<td>76</td>
<td>12</td>
<td>9.039</td>
<td>2.705</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n = 157
* Max. Poss. is the maximum possible score for each attitude scale.
Only one attitude scale (AT1) showed a significant difference between boys and girls beyond the .05 level of confidence. There was a small but significant difference between boys' and girls' general school attitudes. Girls' mean scores were higher which indicates that they showed a generally more positive attitude toward school than boys. Hypothesis three is therefore confirmed for attitude factor AT1 only. There were no significant differences between girls and boys on attitude scales AT2 (toward rule following), AT3 (toward reading), or AT4 (toward arithmetic). On all four scales, both girls and boys exhibited positive attitudes.

H4 - There is not a significant relationship between the total attitude measure (TAM) and achievement test scores in reading and arithmetic.

To test for a relationship between achievement in reading and arithmetic and the total school attitude measure which is the sum of attitude scales AT1, AT2, AT3, and AT4, Pearson product-moment correlations were calculated. The results of these calculations appear in Table 7.
Table 7

Pearson Product-Moment Correlations Between Total Attitude Measure (TAM) and Achievement in Reading and Arithmetic

<table>
<thead>
<tr>
<th>Total Attitude Measure (TAM)</th>
<th>Reading Ach.</th>
<th>Arithmetic Ach.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.227</td>
<td>.290</td>
</tr>
<tr>
<td></td>
<td>p = .004</td>
<td>p = .000</td>
</tr>
</tbody>
</table>

n = 157

Results of the Pearson product-moment correlations reveal that the total combined score of the four school attitude scales has a low, yet significant, correlation with achievement scores in reading, $r = .227$, and arithmetic achievement ($r = .290$). Both correlations are significant well beyond the .05 level of significance. Therefore, hypothesis four is rejected based upon the significance of the reported Pearson correlation coefficients even though those correlations are of a low magnitude.

H5 - There is not a significant relationship between achievement test scores in reading and arithmetic and subscale scores measuring attitude toward (1) school, (2) following school rules, (3) reading and (4) arithmetic.

Hypothesis 5 is an extension of Hypothesis 4 which tests the relationships of specific attitudes with achievement. Attitudes related to specific academic
subjects have been shown in previous studies to have a negligible or nonexistent influence on measured achievement. Table 8 presents the Pearson product-moment correlations between achievement in reading and arithmetic and attitudes toward school (AT1), school rules (AT2), reading (AT3) and arithmetic (AT4).

Table 8

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Achievement</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Read.</td>
<td>Arith.</td>
<td>Total</td>
</tr>
<tr>
<td>AT1 (School)</td>
<td>.111</td>
<td>.154</td>
<td>.137</td>
</tr>
<tr>
<td></td>
<td>p=.166</td>
<td>p=.055</td>
<td>p=.008</td>
</tr>
<tr>
<td>AT2 (Rules)</td>
<td>.147</td>
<td>.213</td>
<td>.008</td>
</tr>
<tr>
<td></td>
<td>p=.067</td>
<td>p=.008</td>
<td>p=.017</td>
</tr>
<tr>
<td>AT3 (Read.)</td>
<td>.229</td>
<td>.210</td>
<td>.229</td>
</tr>
<tr>
<td></td>
<td>p=.004</td>
<td>p=.008</td>
<td>p=.004</td>
</tr>
<tr>
<td>AT4 (Arith.)</td>
<td>.224</td>
<td>.252</td>
<td>.246</td>
</tr>
<tr>
<td></td>
<td>p=.005</td>
<td>p=.001</td>
<td>p=.002</td>
</tr>
</tbody>
</table>

All correlation coefficients in Table 8 are of a negligible or low magnitude, ranging from r=.13 to r=.25. All are significant at the .05 level of confidence or beyond except correlations between general attitudes toward school and reading achievement and between attitudes toward rule following and reading achievement. There is a significant correlation between positive attitudes toward reading and arithmetic and achievement in reading and arithmetic. Hypothesis 5 is therefore rejected based on
correlational data in Table 8 with the two exceptions as noted.

H6 - There is a significant relationship between teacher rated ability in reading (RD) and arithmetic (AR) and achievement test scores in reading (R) and arithmetic (A).

The data in Table 9 show that there are significant correlations between teacher assigned ability ratings in reading and arithmetic and achievement test scores in reading and arithmetic. All correlation coefficients are of a substantial magnitude significant beyond the .001 level of significance.

Table 9

Pearson Product-Moment Correlations Between Teacher Assigned Ability Ratings and Achievement in Reading and Arithmetic

<table>
<thead>
<tr>
<th></th>
<th>Rated Reading Ability</th>
<th>Rated Arithmetic Ability</th>
<th>Rated Total Ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>0.660</td>
<td>0.676</td>
<td>0.697</td>
</tr>
<tr>
<td></td>
<td>p=.001</td>
<td>p=.001</td>
<td>p=.001</td>
</tr>
<tr>
<td>Arithmetic</td>
<td></td>
<td>0.651</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>p=.001</td>
<td></td>
</tr>
<tr>
<td>Total Ach.</td>
<td>0.676</td>
<td>0.646</td>
<td>0.697</td>
</tr>
<tr>
<td></td>
<td>p=.001</td>
<td>p=.001</td>
<td>p=.001</td>
</tr>
</tbody>
</table>

Data from Table 9 support Hypothesis 6 that there is a significant relationship between teacher rated ability
and students' achievement. Students who scored high in reading and arithmetic received high ability ratings from their teachers in those subjects and students who scored low in reading and arithmetic received low ability ratings in those subjects. Hypothesis 6 is therefore accepted.

Additional analysis of data produced several interesting results when attitude, achievement, and motivation variables were examined at each grade level (2, 4, and 6). Also, separating data into urban and suburban groups allowed comparisons to be made between these two different educational environments.

Tables 10 and 11 represent cross-sectional data from grades two, four, and six for the target sample of 157 S's. Table 11 shows the results of a one-way ANOVA testing for significant differences between TAM mean scores for motivational subgroups at each grade level. TAM mean scores generally decrease between grades two and six. Exceptions to this pattern are seen between second and fourth grade for higher motivated girls and between fourth and sixth grade for lower motivated girls. Between motivation subgroup differences reach significance in grades two and four but not in grade six.
Table 10

Total Attitude Measure AT1 + AT2 + AT3 + AT4 (TAM) By Grade Level

<table>
<thead>
<tr>
<th>Grade</th>
<th>n</th>
<th>TAM</th>
<th>Std.Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>78</td>
<td>50.846</td>
<td>8.717</td>
</tr>
<tr>
<td>4</td>
<td>27</td>
<td>51.037</td>
<td>7.046</td>
</tr>
<tr>
<td>6</td>
<td>52</td>
<td>44.615</td>
<td>7.598</td>
</tr>
<tr>
<td>Total</td>
<td>157</td>
<td>48.815</td>
<td>8.570</td>
</tr>
</tbody>
</table>

Table 11

One-Way Analysis of Variance
Total Attitude Measure (TAM) by Motivational Subgroup In Grades 2, 4, 6

<table>
<thead>
<tr>
<th>Total Attitude Measure</th>
<th>SUM OF S</th>
<th>MEAN OF S</th>
<th>SQ OF F</th>
<th>SIG OF F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HB</td>
<td>56.50</td>
<td>53.53</td>
<td>45.00</td>
<td>47.74</td>
</tr>
<tr>
<td>HG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HB</td>
<td>52.25</td>
<td>56.00</td>
<td>44.14</td>
<td>45.50</td>
</tr>
<tr>
<td>HG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HB</td>
<td>44.13</td>
<td>46.86</td>
<td>40.45</td>
<td>46.42</td>
</tr>
<tr>
<td>HG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LG</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D.F. = 3

Table 12 shows total achievement mean Z-scores (ZT) for the target sample in grades two, four, and six. No significant differences were observed across grade levels for total achievement (ZT) in reading and arithmetic.
Table 12
Total Achievement By Grade Level

<table>
<thead>
<tr>
<th>Grade</th>
<th>n</th>
<th>Means (ZT)</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>78</td>
<td>.147</td>
<td>1.856</td>
</tr>
<tr>
<td>4</td>
<td>27</td>
<td>-.028</td>
<td>1.970</td>
</tr>
<tr>
<td>6</td>
<td>52</td>
<td>-.164</td>
<td>1.911</td>
</tr>
<tr>
<td>Total</td>
<td>157</td>
<td>.014</td>
<td>1.887</td>
</tr>
</tbody>
</table>

Table 13 presents a one-way ANOVA to statistically confirm the observations that no significant differences exist between grade levels in total achievement scores for the entire sample.

Table 13
One-Way Analysis of Variance
Achievement by Grade Levels 2, 4, 6

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>F Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betwn. Groups</td>
<td>2</td>
<td>3.069</td>
<td>1.535</td>
<td>.428</td>
<td>.653</td>
</tr>
<tr>
<td>With. Groups</td>
<td>154</td>
<td>552.176</td>
<td>3.586</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>156</td>
<td>555.245</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 14 shows the Pearson product-moment correlations between TA motivation and achievement scores in reading and arithmetic across grades two, four, and six for an urban school sub-sample. This sample was composed of only students designated as higher or lower motivated by
their teachers. Substantial to very substantial correlations were reported in grades two and four between TA motivation and achievement, while correlations between the same variables at the sixth grade level were minimal or non-existent.

Table 14

Pearson Correlations
Between Motivation (TA) and Achievement
in Reading (ZR) and Arithmetic (ZA)
Grades Two, Four, and Six (Urban)

<table>
<thead>
<tr>
<th></th>
<th>Reading</th>
<th>Arithmetic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gr. 2</td>
<td>.753</td>
<td>.635</td>
</tr>
<tr>
<td>Gr. 4</td>
<td>.668</td>
<td>.604</td>
</tr>
<tr>
<td>Gr. 6</td>
<td>.009</td>
<td>.071</td>
</tr>
</tbody>
</table>

TA MOT.  
p=.000  
n=32

Table 15 shows the Pearson product-moment correlation between TA motivation and achievement in reading and arithmetic across grades two and six in a suburban school subsample for higher and lower motivated students.

Table 15

Pearson Correlations
Between Motivation (TA) and Achievement
in Reading (ZR) and Arithmetic (ZA)
Grades Two and Six (Suburban)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gr. 2</td>
<td>.582</td>
<td>.224</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gr. 6</td>
<td>.516</td>
<td>.715</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TA MOT.

p=.001  
n=29

p=.028  
n=18

p=.242  
n=29

p=.001  
n=18
There is a significant relationship between TA motivation and achievement in reading at grade level two and grade level six in the suburban population of higher and lower motivated students. Substantial correlations exist between TA motivation and reading achievement at both the second and sixth grades. However, a low non-significant correlation appears at the second grade level for arithmetic while a very substantial, highly significant relationship between arithmetic and TA motivation is seen in the sixth grade. Standardized achievement test data from an urban subsample (Table 14) and a suburban subsample (Table 15) show that the correlation between TA motivation and achievement is different in the two settings. TA motivation has a significant relationship with achievement in the second and sixth grades in the suburban setting except at the second grade level for arithmetic achievement. This highly significant relationship is not in evidence in the sixth grade urban setting while concurrently there was no significant change in total achievement scores in the urban school setting.

The standardized achievement test data and TA motivational ratings taken from an urban subsample and a suburban subsample showed inconsistencies in the under study relationship. The urban subsample (Table 14) shows that the significant correlations between TA motivation and
achievement found in grades two and four no longer existed in grade six. In the suburban subsample a significant correlation between TA motivation and achievement was maintained between grade two and grade six. An exception to this trend is seen at the second grade level for arithmetic achievement.

Examining the achievement and motivation data in the urban subsample revealed that achievement remained fairly stable in the six grades while motivational ratings decreased. This same decrease in motivational ratings in the sixth grade did not occur in the suburban subsample. A motivation decrease in the urban school subsample may accompany a feeling that school achievement is increasingly irrelevant to urban school children whereas this growing feeling of irrelevancy is not as early a phenomenon in the suburban school environment.

Table 16 (Urban) and Table 17 (Suburban) show the results of Analyses of Variance (ANOVA) using motivation and grade level as independent variables and achievement as the dependent measure in the two different educational environments. The slashed lines separate the analysis reports for arithmetic, reading, and total achievement, respectively. These results corroborate the Pearson correlational data reported in Table 14 and 15. That is, motivation (MOT) and grade are both shown to be significant intervening variables (at .05 level) with
achievement in the urban school setting with the exception of one case where grade with arithmetic achievement failed to reach the .05 level of significance. Whereas, only motivation showed significant F values (at the .05 level) in the suburban school setting in grades 2 and 6 indicating motivation but not grade level had a significant relationship to achievement. Only one significant interaction effect was seen between motivation and grade level for achievement in reading in the suburban school setting.

Table 16 (Urban)

Analysis of Variance Total Achievement in Reading and Arithmetic by Grade and Motivation Level

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>D.F.</th>
<th>Mean Squares</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>40.993</td>
<td>1</td>
<td>40.993</td>
<td>77.170</td>
<td>.000</td>
</tr>
<tr>
<td>Grade with ZA</td>
<td>4.292</td>
<td>2</td>
<td>2.146</td>
<td>4.040</td>
<td>.021</td>
</tr>
<tr>
<td>Motivation</td>
<td>52.163</td>
<td>1</td>
<td>52.163</td>
<td>101.858</td>
<td>.000</td>
</tr>
<tr>
<td>Grade with ZR</td>
<td>2.349</td>
<td>2</td>
<td>1.175</td>
<td>2.294</td>
<td>.106</td>
</tr>
<tr>
<td>Motivation</td>
<td>185.641</td>
<td>1</td>
<td>185.641</td>
<td>112.999</td>
<td>.000</td>
</tr>
<tr>
<td>Grade with ZT</td>
<td>12.46</td>
<td>2</td>
<td>6.284</td>
<td>3.793</td>
<td>.026</td>
</tr>
</tbody>
</table>
### Table 17 (Suburban)
#### Analysis of Variance Total Achievement in Reading and Arithmetic by Grade and Motivation Level

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>D.F.</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>15.686</td>
<td>1</td>
<td>15.686</td>
<td>18.241</td>
<td>.000</td>
</tr>
<tr>
<td>Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with ZA</td>
<td>.213</td>
<td>1</td>
<td>.213</td>
<td>.248</td>
<td>.621</td>
</tr>
<tr>
<td>Motivation</td>
<td>18.047</td>
<td>1</td>
<td>18.241</td>
<td>36.569</td>
<td>.000</td>
</tr>
<tr>
<td>Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with ZR</td>
<td>1.157</td>
<td>1</td>
<td>1.157</td>
<td>2.344</td>
<td>.132</td>
</tr>
<tr>
<td>2-Way Interactions</td>
<td>2.095</td>
<td>1</td>
<td>2.095</td>
<td>4.245</td>
<td>.045</td>
</tr>
<tr>
<td>Motivation</td>
<td>67.384</td>
<td>1</td>
<td>62.384</td>
<td>30.199</td>
<td>.000</td>
</tr>
<tr>
<td>Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with ZT</td>
<td>.377</td>
<td>1</td>
<td>.377</td>
<td>.169</td>
<td>.683</td>
</tr>
</tbody>
</table>
CHAPTER V

SUMMARY AND CONCLUSIONS

Overview

The purpose of this study was to determine the degree to which elementary school children's sex, academic motivational level, school attitudes, and ability are related to their academic achievement. Early research findings by Kagan (1964), Kellogg (1969), Hill, et al. (1974) linking student's sex to motivation and motivation to achievement lacked empirical evidence to substantiate their conclusions. This study was designed to test the central proposition that girls are more highly motivated in the early grades (1-3) than boys and that this greater motivation is linked to higher academic achievement.

The study sample was chosen from two school districts in the southwestern part of Ohio. Subjects were drawn from a city school district and a suburban local school district to increase the likelihood of obtaining a representative sample of SES levels in the population of 735. From this population of 735 students in three elementary school, a target sample of 157 boys and girls,
from grades two, four, and six, was identified.

Administration of questionnaires and other data collection forms was carried out by the researcher in the Spring, two months prior to the cessation of classes. Chapter III describes in detail the procedures used and data collected at that time.

Conclusions and Recommendations

Testing of Hypothesis 1 indicated that there was a relationship between TA motivational level and achievement test scores in reading and arithmetic. No relationship was disclosed between the sex of the subject and motivational ratings nor between sex of the subject and achievement test scores in reading and arithmetic. These findings only partially confirm the earlier research findings of Kagan (1964), Kellogg (1969), Hill, et al. (1974) that sex of the student predicts motivation to achieve and that motivation predicts school achievement. In these former studies, girls in the early grades (1-3) were reported to be more highly motivated and to be higher achievers than boys whereas boys were reported to be less motivated and to be lower achievers than girls. No relationship was found in this study linking sex with motivational group or sex/motivational subgroup with achievement. When motivation was controlled between boys and girls, no significant differences were observed
between the achievement of boys and girls in reading and arithmetic. The instrument used to measure motivation in this study relied upon a rating by teachers rather than, as in earlier studies, the self reporting by subjects as to the sex-appropriateness of school objects or school activities from which motivation was inferred. Findings reported here for relationships between school achievement and sex differences generally agreed with recent research on achievement and sex differences which suggests that there is greater variance in achievement within groups of boys and girls than there is between groups of boys and girls. Research answering the question of whether boys or girls are more highly motivated to master academic tasks is not clear. This study examined this question by identifying higher and lower motivated students and their standardized achievement test scores. Research using teacher ratings to assess levels of academic motivation has not been reported in the literature. This methodology may help to clarify the relationship between academic achievement and motivation for boys and girls in the elementary grades. Using a teacher rating scale is a technique that is relatively easy to use and quantitatively interpretable. The bases for measuring motivation using this conceptual approach was partially suggested by the work of Frymier (1974).
Future research might examine all subjects found at each grade level rather than only a selected number of higher and lower motivated students. This research could not determine if there existed a larger number of highly motivated girls than boys but could only compare the four higher and lower motivated girls in each class with the four higher and lower motivated boys in each class. While comparing groups of boys and girls having the same dichotomized motivation levels revealed no sex differences, analyzing all cases of boys and girls would aid in determining the consistency of the results reported here. The significance of the relationship between motivation level and academic achievement is not likely to be affected when using all students at each grade level. If motivation is related to academic achievement, the relationship may be most evident in the extremely high and extremely low motivational groups. The highest motivated to achieve should be the highest achievers and the lowest motivated should be the lowest achievers. The question of the relationship of middle ratings of motivation to achievement could also be investigated by analyzing total classes. Also, the nonavailability of standardized achievement test scores which caused a loss of subjects in the target sample, suggests that a short achievement test might be administered in conjunction with the attitude instruments. The significance of the relationship between
motivation and achievement was established through a test of Hypothesis 1 where substantial correlations were discovered. Analysis of the data failed to disclose a relationship between sex of the student and motivation level. And therefore no significant difference was revealed between the achievement of highly motivated girls and boys or lower motivated girls and boys.

Testing of Hypothesis 2 indicated that there is a relationship between TA motivational ratings and four school attitude scales. A generally positive attitude toward school (AT1) and a positive attitude toward arithmetic (AT4) were moderately correlated with TA (motivation), r=.36 and r=.38, respectively. A positive attitude toward rule following (AT2) and reading (AT3) produced low correlations with TA motivation, r=.21 and r=.23, respectively.

The question of whether the attitude measures and motivation ratings in this study are related to the same underlying concepts was partially tested by Hypotheses 4 and 1. Since correlations between attitude scales and achievement (H4) are considerably lower than correlations between motivational ratings and achievement (H1) it is possible that two different phenomena are being measured. If this were not true, there might be exactly the same correlations between attitude and achievement and motivation and achievement.
These findings support those of researchers who found a weak relationship between attitudes and achievement (Neale, 1969; Deutscher, 1973; Fishbein and Ajzan, 1975; Schuman and Johnson, 1976) and a moderate relationship between motivation and achievement (Cattell, Barton and Dielman, 1972).

Testing of Hypothesis 3 disclosed a significant difference ($t = .232$) between the mean scores for boys and girls on general attitudes toward school. Girls' mean scores on subscale AT1 which indicated positive attitudes toward school were significantly higher than boys. No other relationships were found to be significantly different between sex and (1) positive attitudes toward rule following (AT2), (2) positive attitudes toward reading (AT3), or (3) positive attitudes toward arithmetic (AT4).

This finding, that girls show more positive attitudes toward school (AT1) and that their attitudes are significantly more positive than boys' general attitudes toward school, appears to confirm the findings of Kagan (1964); Kellogg (1969); and Hill, et al. (1974). The latter researchers concluded that girls are more highly motivated than boys. But, since attitudes are conceptually different than academic motivation and they failed to actually measure motivation, their conclusions are very questionable.
Testing of Hypothesis 4 revealed that the total attitude measure (TAM) is related to achievement in reading and arithmetic. However, this analysis masked any existing relationship between attitudes toward school and achievement. Data related to Hypothesis 5 revealed this relationship by looking specifically at each attitude subscale score and its relationship to achievement.

Data from Table 5 showed that girls have more positive attitudes toward school than boys. Additionally, data from Table 6 showed a significant relationship between the total attitude measure (TAM) and reading and arithmetic achievement. If total positive attitudes are significantly related to achievement, girls would be expected to show superior achievement based upon their more positive general attitudes toward school. This differential achievement favoring girls did not emerge from the achievement data in this study (see Table 3). Because the target sample did not contain more higher achieving girls than boys, Kagan's theory as supported by Kellogg (1969) and Hill, et al. (1974) cannot be fully rejected. Therefore, future research might choose S's according to achievement levels and following administration of a motivational assessment, determine the correlation between the two measures.

Applying all instrumentation developed in this study to all subjects in classrooms across the early grade
levels could produce corroborating evidence that girls' greater academic gains are related to their more positive attitudes and higher academic motivation. Examining only extreme motivational groups with equal numbers of boys and girls in each group could have precluded inclusion of a number of highly motivated girls (or boys) in the sample.

Testing of Hypothesis 5 disclosed generally negligible to low Pearson correlation coefficients between attitude subscale scores and achievement. Low magnitude correlations (r=.21 to r=.25) between positive attitudes toward reading and reading achievement and between attitudes toward arithmetic and arithmetic achievement were higher than the correlations between generally positive attitudes toward school and achievement or positive attitudes toward rule following and achievement. While the literature related to measured attitudes toward subject matter and achievement suggests nonsignificant relationships such nonsignificance is not supported by this study. While intuitively one would think positive attitudes toward one's studies and school relate highly with achievement, a high relationship between attitudes and achievement remains to be established.

Testing of Hypothesis 6 revealed that total ability in reading and arithmetic (TOT), as assigned by teachers on a one to ten scale, has the strongest significant relationship with standardized achievement test scores in
reading \((r=.66)\) and arithmetic \((r=.65)\) among the independent variables investigated in this study. These results confirm numerous studies that have reported similar findings. Contrary results were reported by Fitzpatrick (1978) who found attitude to have a more positive significant relationship to mathematics achievement than ability. Her biased sample containing only "bright" tenth grade girls may account for the discrepancy with findings reported here. These contrasting results serve to highlight the complexity of measuring attitudes and their relationship with achievement. The findings of Neal (1969), Cattell, Barton, and Dielman (1972) are consistent with this study. The latter studies reported that ability, as measured by the Thurstone Primary Mental Abilities Test, was the most significant variable tested that related to achievement in reading and arithmetic.

The following reported results do not test hypotheses in this study but emerged from a secondary analysis of data. They are interesting because they provide a more detailed examination of relationships analyzed during hypothesis testing.

When the mean scores for TAM were examined in grades two, four, and six for the entire target sample (Table 10), a decrease was noted between grade two and six. This was shown by ANOVA analysis to be a significant variance
between grade levels. General attitudes toward school and school activities significantly decreased for all S's between grade two and grade six.

Examination of Table 12 shows that total mean achievement test scores in reading and arithmetic (ZT) across grades two, four, and six for the entire target sample did not decrease noticeably. No significant decrease between grades in mean total achievement test scores was statistically confirmed through ANOVA analysis (Table 13).

A significant decrease in TAM mean scores between grades two and six might have predicted a significant decrease in total mean achievement test scores across the same grade levels for the same target sample. There was a decrease in achievement scores across grade levels two, four, and six, however, this decrease was not significant (Table 13). This analysis supports the weak relationship seen in previous data between attitude and achievement.

Further examination of data was performed dividing the target sample into subsamples representing urban and suburban school settings. An examination of this data across grade levels revealed that differences existed in the measured relationship between the urban and suburban school setting. Reading and Arithmetic achievement (ZR and ZA) were highly correlated with academic motivation (TA) in the urban school setting in grades two and four
Table 18
Tested Relationships
Between Major Variables and Results*

<table>
<thead>
<tr>
<th>H1</th>
<th>Motivation</th>
<th>Achievement</th>
</tr>
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<tbody>
<tr>
<td>TA</td>
<td>Reading r=.59</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Arithmetic r=.57</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sex of Subject r=.12</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Sex of Subject</th>
<th>Achievement</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Reading r=.01</td>
</tr>
<tr>
<td></td>
<td>Arithmetic r=.07</td>
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<table>
<thead>
<tr>
<th>H2</th>
<th>Motivation</th>
<th>Attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>TA</td>
<td>Toward School r=.36</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toward Arith r=.38</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toward Rules r=.21</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toward Read r=.23</td>
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</table>

<table>
<thead>
<tr>
<th>H3</th>
<th>Sex of Subject</th>
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<tbody>
<tr>
<td></td>
<td>Toward School r=.18</td>
<td></td>
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<tr>
<td></td>
<td>Toward Rules r=.12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toward Read r=.05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toward Arith r=.04</td>
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<thead>
<tr>
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</tr>
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<tbody>
<tr>
<td>TAM</td>
<td>Reading r=.23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Arithmetic r=.29</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H5</th>
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<th>Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>School (AT1)</td>
<td>Reading r=.11</td>
<td></td>
</tr>
<tr>
<td>Rules (AT2)</td>
<td>Reading r=.14</td>
<td></td>
</tr>
<tr>
<td>Reading (AT3)</td>
<td>Reading r=.22</td>
<td></td>
</tr>
<tr>
<td>Arithmetic (AT4)</td>
<td>Reading r=.22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Arithmetic r=.21</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H6</th>
<th>Ability</th>
<th>Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>Reading r=.66</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Arithmetic r=.65</td>
<td></td>
</tr>
</tbody>
</table>

*→ indicates a relationship significant at .05 level
/→ indicates no significant relationship
but not in grade six (Table 14). In the suburban school setting reading and arithmetic achievement were highly correlated with academic motivation at both the second and sixth grade level (Table 15). The loss of the relationship between achievement and motivation at the sixth grade level is curious and should be a subject for further study.

Table 18 summarizes the significant and nonsignificant relationships revealed during the analyses of hypotheses H1-H6 with their respective Pearson correlation coefficients. These findings indicate that academic motivation has a greater relationship to achievement than does attitude toward school or attitude toward school activities for both boys and girls.

The following are general conclusions and recommendations for future research based upon the analysis of the six research hypotheses as stated in Chapter IV.

The question of whether gender is significantly related to motivation, attitudes, and achievement in elementary school is not answered by this study for the total school population but only for those identified higher and lower motivated boys and girls. Sex was not found to be significantly related to motivation, attitudes, and achievement for either higher or lower motivated boys or girls. These results do not confirm
previous research which suggested that the superior achievement of girls was based upon their higher levels of school motivation. Furthermore, higher motivated boys, on the average, outperformed higher motivated girls on all achievement measures reported in this study. These results should prompt additional studies testing the premise that girls generally exhibit superior motivation and achievement in the early grades.

During the twenty years since Kagan (1974) proposed that girls' superior achievement in the early grades (1-3) was accounted for by their higher academic motivation changes in school environment may have affected boys' general motivation and achievement in school. Additional research to confirm these improvements and document these changes needs to be undertaken.

Positive attitudes toward school and reading and arithmetic are significantly related to the achievement in reading and arithmetic of higher and lower motivated boys and girls in grades two, four, and six. This relationship supports the importance of positive attitudes as they relate to school achievement. It is important to remember that these correlations, while significant, were low and that the groups analyzed may have had the potential to produce qualified results. If the entire study population had been administered all measures included in this study, one can only conjecture as to the results.
The most significant relationships under study were achieved between TA motivation, total ability ratings, and achievement in reading and arithmetic. The significance of these findings may be far reaching as they relate to the importance of motivation and achievement. Teachers exhibited excellent skill in rating the motivational strength of their higher and lower motivated students. Using this technique such an assessment could be used to aid the teacher in helping to raise the academic achievement of those assessed as lower motivated. Caution would need to be taken at this point to guard against the Rosenthal effect, a self-fulfilling prophesy. Teachers, once they have rated their students could proceed to teach with bias for or against a particular level and gender of motivated student. The benefits to gain from a heightened awareness of motivational levels within the classroom could outweigh possible negative effects that may result from teacher bias.

If this study is replicated, care should be taken to prevent teachers from using achievement test data as a substitute for motivation and ability ratings. It is possible that students were rated as high in motivation and high in ability by teachers who were influenced by high achievement test scores, because some teachers may believe motivation, ability, and achievement represent the same construct. Achievement motivated behavior and
ability rating were operationally defined and discussed with teachers prior to their completing the Student Rating Sheets. It is likely that teachers' nine months of association with their students would represent a better indication to them of students' ability and motivational behavior than would the prior year's achievement test scores.

Attitudes are often thought to be a very significant variable related to academic achievement and much time is expended developing attitudinal assessment instruments to survey wide varieties of attitudes related to school. Expending time to assess and influence positive attitudes may be less significant over both the short and long term than would efforts directed at assessing and influencing achievement motivation. When attitude, motivation, and ability factors are analyzed concurrently, ability exhibits the greatest relationship with achievement. Attitudes are more easily affected than motivation but attitude changes are also thought to be less permanent. Efforts directed toward influencing basic achievement motivation could have longer lasting educational benefits where life long learning is an important goal. Recent programs, such as career education, which seek to inject relevance into school assignments and instill a work ethic are directed at motivational change rather than attitude enhancement. Such approaches should
be encouraged because they may affect both increased academic performance and longer term learning interests.

The question regarding the consistency of attitudes, motivation, and achievement measures across grades and SES levels is only partly examined in this study. Over the entire target sample (n=157) from grades two, four, and six, the correlations between attitudes and achievement show a significant decrease. However, boys' achievement scores tended to increase in the suburban environment across the same grades. This documents a difference in the relationships between attitudes and achievement for boys in suburban school settings. This difference should be one of the questions for further investigation contrasting urban and suburban school settings.

TA motivation, as it relates to achievement in reading and arithmetic, shows a more significant relationship to achievement than do measures of attitudes. The relationships between TA motivation is similar between grades two and four (Table 14) but this very substantial correlation shows no significance at the sixth grade level in the urban (lower SES level) sample. These data also indicate that in the urban sample by the sixth grade the achievement of higher and lower motivated boys and girls is not related to their motivational level. In the suburban population, TA motivation continues to have a
strong relationship to achievement in reading and arithmetic for higher and lower motivated boys and girls.

The greater consistency and significance of the relationship between TA motivation and achievement in the suburban setting may be unique to this study. If this difference is documented in future studies, research attempting to explain this difference would be justified.

It is recommended from the overall results of this investigation that results showing relationships between TA motivation and achievement be reexamined. Subjects would be chosen according to higher and lower standardized achievement test scores and then be administered motivation and attitude measures. This could provide confirmation of results related to the same variables using a more valid, nonjudgmental selection criterion. Finally, examining all subjects in randomly selected classrooms would provide data to test the proposition that girls represent a larger group of higher achieving and higher motivated students than do boys.
## APPENDICES

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Title</th>
<th>Page</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>Attitude Toward School Scale (ATSS)</td>
<td>83</td>
</tr>
<tr>
<td>B</td>
<td>School Related Activities Scale (SRAS)</td>
<td>85</td>
</tr>
<tr>
<td>C</td>
<td>Student Rating Sheet</td>
<td>87</td>
</tr>
<tr>
<td>D</td>
<td>Initial Orientation Meeting</td>
<td>89</td>
</tr>
<tr>
<td>E</td>
<td>Instruction for Teachers</td>
<td>91</td>
</tr>
<tr>
<td>F</td>
<td>Frymier's Model of Academic Motivation</td>
<td>93</td>
</tr>
</tbody>
</table>
APPENDIX A

ATTITUDE TOWARD SCHOOL SCALE
APPENDIX A

ATTITUDE TOWARD SCHOOL SCALE

<table>
<thead>
<tr>
<th>Student</th>
<th>Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.D. Number</td>
<td>Your Age</td>
</tr>
</tbody>
</table>

Directions: Please answer each of the questions below by putting a check (X) under one of the four headings in the columns to the right of the questions. These four columns are:

1. Nearly Always or Most of the Time
2. Sometimes
3. Seldom or Not Very Often
4. Almost Never

<table>
<thead>
<tr>
<th></th>
<th>(1) Nearly Always</th>
<th>(2) Sometimes</th>
<th>(3) Seldom</th>
<th>(4) Almost Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I like to learn from books.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. My school work is interesting.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I feel good when we do arithmetic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I feel good when it is time to read.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I like to go to school.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. In school I have felt relaxed and at ease.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I feel good about the things we do in school.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. During school hours, I'd rather be in school than anywhere else.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I like to do arithmetic problems.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. When I am in school I feel good.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX B

SCHOOL RELATED ACTIVITIES SCALE
APPENDIX B
SCHOOL RELATED ACTIVITIES SCALE

Student  
I.D. Number  
Teacher  
Your Age

Directions: Written below are some activities that take place at school. Circle VH, H, U, or VU that tells how you feel about the activity most of the time. You may circle only one of the choices after each number.

Very Happy - VH  Happy - H  Unhappy - U  Very Unhappy - VU

This is how I feel in school when:

1. reading a book  VH  H  U  VU
2. helping another student  VH  H  U  VU
3. taking a spelling test  VH  H  U  VU
4. raising my hand before speaking  VH  H  U  VU
5. turning in homework  VH  H  U  VU
6. caring for classroom pet  VH  H  U  VU
7. keeping my desk neat  VH  H  U  VU
8. writing a story  VH  H  U  VU
9. helping the teacher  VH  H  U  VU
10. working without talking  VH  H  U  VU
11. practicing handwriting  VH  H  U  VU
12. answering questions  VH  H  U  VU
13. following playground rules  VH  H  U  VU
14. working on arithmetic  VH  H  U  VU
15. working on science  VH  H  U  VU
APPENDIX C

STUDENT RATING SHEET

Teacher                      Student
Grade                        I.D. Number

Directions: Please complete one rating sheet for each student you have identified as having either high or low school motivation. Fill in identification information as indicated except for I.D. number.

On the School Motivation Scale, numerals 1 through 3 represent degrees of lower motivation; numerals 4 through 7 represent degrees of average motivation; and numerals 8 through 10 represent degrees of higher motivation.

SCHOOL MOTIVATION

1 2 3 4 5 6 7 8 9 10
Low High

The Reading Ability and Arithmetic Ability scales are intended to be estimates of a student's overall ability in each subject. For example, 1 through 3-low range; 4 through 7-average range; 8 through 10-high range.

READING ABILITY

1 2 3 4 5 6 7 8 9 10
Low High

ARITHMETIC ABILITY

1 2 3 4 5 6 7 8 9 10
Low High
APPENDIX D

INITIAL ORIENTATION MEETING
APPENDIX D

INITIAL ORIENTATION MEETING

RESEARCH STUDY
March 1985

Purpose: The purpose of this research is to explore the relationships between cognitive achievement and motivation.

Delimitations: Cognitive achievement will be limited to reading and arithmetic.

Motivation will be measured in two areas: attitudes toward school and feelings about school activities.

Study Population: Grades 2, 4, 6

Requirements of classroom teacher:
1. Allow researcher to give two questionnaires.
   - Attitude Toward School Scale (10 items)
   - School Related Activities Scale (15 items)

2. Fill out a "Student Rating Sheet" for eight students.

Benefits: Each teacher will receive data related to the variables of this study for their classroom. Viewing data across grade levels may be of interest to teachers and school officials.

Assurance: NO DATA WILL BE GENERATED THAT IN ANY WAY COULD BE USED TO EVALUATE INDIVIDUAL TEACHERS OR THE SCHOOL PROGRAM.
APPENDIX E

INSTRUCTIONS FOR TEACHERS
APPENDIX E

INSTRUCTIONS FOR TEACHERS

1. a. Choose two boys you consider highly motivated in school. These students usually like to go to school, like to learn from books, and feel good about other things they do in school. (You need not identify students who are identical in these traits, only as nearly alike as possible.)

b. Rate each student on the three scales (School Motivation, Reading Ability, Arithmetic Ability) using a separate sheet for each student.

c. Follow the same procedure for two boys with lower school motivation. These students usually do not like to go to school, do not like to learn from books, and do not feel good about other things they do in school.

d. Now, choose two higher motivated girls and two girls with lower school motivation. Rate them.

2. The School Motivation Scale and the School Activities Scale will be administered to your class by the researcher.

Thank you for your help in this research effort. A summary of the results that are pertinent to your class will be compiled and made available to you in the near future.
APPENDIX F

FRYMIE'S MODEL OF ACADEMIC MOTIVATION
APPENDIX F

FRYMIER'S MODEL OF ACADEMIC MOTIVATION*

Dimensions (1-3)

1. Internal - External

Directionality

Positive
A. +sense of worth
B. +lack of prejudice

Negative
A. -excessive anxiety or fear
B. -jumping to conclusions

2. Intake - Output

Positive
A. +voracious reading
B. +attentive listening

Negative
A. -reading without comprehension
B. -inattentive listening

3. Approach - Avoidance**

Positive
A. +ordering information by mail
B. +attending nonrequired lectures

Negative
A. -doing homework only for teacher
B. -copying an examination

A. +writing extensively
B. +practicing skills
A. -disruptive talking
B. -telling teacher off
A. +variety of points of view
A. +validity of information
A. -limited sources of information
B. -validity postulated with no external referents
A. -reading without comprehension talking
B. -inattentive listening
A. +dropping a course that is poorly taught
B. +turning off radio during study hours
A. -daydreaming
B. -giving up during test

*The dimensions of the model are illustrated by positive and negative behaviors. The pattern or relationship is all important, not the specific incidents or behavior described.
**Approach-Avoidance denotes the attainment of or rejection of learning objectives or goals.
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