THE CORRELATIONS OF READING ACHIEVEMENT AND SELF CONCEPT AT GRADES THREE, FIVE, SEVEN, EIGHT, TEN AND TWELVE

by

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B.Ed., University of British Columbia, 1967

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS
in
THE FACULTY OF EDUCATION
Department of Reading

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

September, 1976

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ABSTRACT

The purpose of this study was to determine the relationship between self concept and reading ability at different stages in a child's school career. Subjects were selected at random from grades three, five, seven, eight, ten and twelve from schools in one school district. Approximately 125 to 150 students at each grade level were tested with the Nelson Reading Test or the Nelson Denny Reading Test and the students were then assigned to groups of poor, average or good readers on the basis of their percentile scores for their grade. Twenty students were randomly selected from each ability group at each grade level to receive the Piers Harris Children's Self Concept Scale.

Raw scores on the reading test were correlated with self concept scores for each grade level. Correlations were significant at the grade three, five, seven, and eight levels, lower but significant at the grade ten level and not significant at the grade twelve level. Mean scores for each ability group at each grade level were computed and analyzed in a six by three factoral design. Effects for ability group and interaction of grade and reading ability were significant. Differences between means for good and poor readers were significant at the grade three, five, seven and eight levels. Post hoc tests were done to find significant tetrad differences.

It appears from the results of this study that although self concept and reading ability are positively correlated in the lower grades, the relationship becomes weaker after grade eight and is nonsignificant at the grade twelve level.

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CHAPTER I

INTRODUCTION AND REVIEW OF THE LITERATURE

Self Concept

In the welter of accumulated research done in education and its many, often conflicting, conclusions, there is one thing that results have repeatedly assured us of, and that is that each child is a unique and individual personality. How an individual acts and reacts within his environment is determined by his self concept. During the past few decades, the study of self concept as a determinator of behavior has become an important facet of educational research.

Several well known theorists have presented their views on the influence of self concept on the individual's behavior, stating that personality is not anchored on biological variables but is determined by social psychological factors. Lecky (1945) contributed to the theory of self-consistency as a primary motivating force in human behavior, stating that an individual is constrained in his behavior by the picture he has formed of self. Cattell (1950) considered the self the principal organizing influence exerted on the individual which gives stability to his behavior and he emphasizes selective perception in the maintenance of self esteem. Carl Rogers (1951) emphasized the importance of self in human adjustment and stated that self is the central aspect of personality--people behave in terms of the way they see themselves. Snygg and Combs (1949) proposed that the basic drive of individuals is the

maintenance and enhancement of self and they claim that "all behavior, without exception, is completely determined by and pertinent to, the phenomenal field of the behaving organism". How a person behaves is the result of how he perceives the situation and himself at the moment of his action. Individuals constantly behave in a manner which is consistent with the way they view themselves (Evans, 1968). Today, more and more psychologists are looking at self concept in relation to educational theory and practice.

The perceptions a person has of himself are on a continuum of positive to negative traits to the extent that he feels these traits are worthy or unworthy in the eyes of his significant others. If a child feels he is not of worth in the eyes of those important to him he becomes unacceptable to himself and develops a negative self concept.

It is generally accepted that the self concept of an individual is not present at birth but that it develops as perspective powers develop (Bodwin, 1959). The self concept is determined by the interaction of that individual with his environment, the most important elements of which are the persons most important to him emotionally and cognitively. These significant others are influential in shaping the individual's self concept through the responses they make to him, or more important, how he perceives their responses and how he infers their valuations of him from their behavior to him.

Once the self concept is established, it has a high degree of stability and tends to resist change (Hamachek, 1965). Individuals may even unwittingly choose those behaviors which 'prove' he is right about himself and others' inferred perceptions of him, (Soares and Soares, 1971) so that as a child grows and experiences, he may subconsciously behave in

such ways as to evoke the treatment or response that he expects--the response which tends to reinforce his self view. Jersild (1952) hypothesized that a person may resist learning that might be beneficial to him because he is trying to protect his image of himself based on the influence of his significant others. This is especially important if early family or school experiences convince a child that he is unable to learn.

Since the self concept of an individual is forming from birth onward, those people who are closest to him in the first years of his life, his parents and other members of his family, are primary forces in the shaping of his self concept. However, when a child enters school, the teachers also assume the role of significant others, partially as a reflection of emphasis placed on education by parents. As the child grows older his peers become more and more important as significant others, gradually replacing the shaping influence of parents and teachers as he attains adulthood. The child who has learned to see himself as inadequate is influenced in his behavior by this self concept until some significant others behave toward him in such a way as to enable that individual to see himself as capable and of worth. For example if a child feels his parents are not pleased with his behavior or accomplishments he may build a negative self concept. When he meets other people who are important to him (such as peers who assume importance in teen years) and they admire him for his behavior or accomplishments his self concept may become more positive.

Self Concept and School Achievement

Many research studies have attempted to discover the relationship between the self concept of an individual and his achievement in school.

A child's academic achievement is determined by several variables and such factors as intellectual ability, economic background, parents' emphasis on education and teaching standards have been linked with school achievement. These do not, however, fully explain why some children appear to have great difficulty learning to read. In attempting to find other factors influential in whether a child achieves in school, researchers have studied the relationship of self concept and academic achievement. Different studies have used different methods of rating academic achievement and have used such measures as grade point average, teachers' ratings, results of standardized tests or a combination of one or more of these with intellectual ability.

Many studies have shown positive relationships between self concept and academic achievement. Lumpkin (1959) matched twenty-four over-achievers with twenty-four underachievers on the basis of chronological age, mental age, sex and home background. The overachievers revealed significantly more positive self concepts. Shaw, Edson, and Bell (1960) used achievers in junior and senior high schools and compared them to under-achievers and found a significant difference for males in self concept, the underachievers having more negative feeling about self than the achievers. Fink (1962) studied two groups of ninth grade students paired for achievement and underachievement. Self concept of each was judged adequate or inadequate by three psychologists on the basis of several rating scales and tests. Data showed significant differences between achievers and non-achievers, the achievers being rated as far more adequate in their concepts of self. Campbell (1967) reported a low positive correlation between Coopersmith's Self Esteem Inventory and academic achievement of fourth, fifth and sixth grade students. Caplin

(1966), in a study of Negro children, found that children who professed more positive self concepts tended to have higher academic achievement. Cole (1975) investigated the relationship between self concept, attitude and achievement motivation of one hundred, average, third grade children with their academic achievement. Their data yielded low, positive and significant ($p < .05$) correlation coefficients for self concept and achievement. Quimby (1967) using achievers versus underachievers, found that the self-ideal relationships of the achievers was significantly higher than the self-ideal relationships of underachievers. Others who have found positive relationships between self concept and academic achievement are Coopersmith (1967), Hughes (1967), Oakland (1969), Jones and Grieneeks (1970) and Bailey (1971).

Some researchers have postulated that deficiencies in self esteem may cause academic underachievement. Gann (1945) stated that her research showed that personality tension unfavourable to learning had formed before the child started school and she rejected the idea that reading disabilities caused personality difficulties. Kunst (1949, p. 133) suggests

> Reading failure in a child of normal intelligence, who has had good teaching, is a neurotic symptom indicating emotional conflict. . . . They simultaneously (while wanting to read) though often unconsciously, wish to fail to read. I think of reading failure not as a passive inability to learn, but as an active, though usually unconscious, protection against learning to read.

This view is supported by Combs' (1957) claims that a person with an adequate self concept will meet life expecting to be successful and will therefore behave in ways that tend to bring about success, while a person who feels he is unable, will feel he cannot succeed and will behave in a manner that will not lead to success.

Other researchers oppose the view that poor self concept or

personality differences cause reading disabilities. Bond and Tinker (1957) suggest that evidence generally indicates that emotional maladjustment is more frequently the effect than the cause. Whether poor self concept causes underachievement or underachievement causes poor self concept is still a controversial issue in research literature and it may well be true that both are true in different cases. Holmes (1955) suggests that where reading disabilities and personality difficulties appear together, the latter may be causes, concomitants or results of reading difficulties.

Self Concept and Reading Achievement

A number of studies have investigated the relationship between personality and reading achievement. Spache (1954) studied fifty retarded readers aged six to fourteen and concluded that retarded readers were more aggressive and cocky, less apt to accept blame or admit fault, less tolerant and more negativistic. These tendencies were less pronounced in their relations with adults than with peers. They tended to avoid open conflict with adults, often assuming a passive attitude. Strang (1940), Kunst (1949) and Bond and Tinker (1957) also stated that emotional disturbances in children were associated with reading disabilities in early grades.

Several studies have dealt with reading and self concept specifically. Wattenburg and Clifford (1964) obtained measures of self concept of kindergarten children, based on self referrent statements obtained as children drew pictures of their family and as they responded to incomplete sentences, and obtained scores representing two dimensions--competence and goodness (personal worth). The results indicated that measures of self concept appear antecedent to and predictive of reading achievement

in the second grade. Lumpkin (1959) compared twenty-four good readers with twenty-four poor readers in grade five to show that good readers revealed significantly more positive self concepts. Lang (1965) found children's perceptions of self gave as good a predictor of later reading achievement as did intelligence scores. Pollock (1972), working with primary children found that reading achievement was significantly related to school self concepts in most groups she tested, but found that the relationship between global self concept and reading achievement only approached .10 significance for the total first grade group and one third grade subgroup. McClenden (1968) found a positive relationship between self esteem and reading at the first grade level. Williams and Cole (1967) worked with eighty sixth grade children and found positive correlations between self concept and reading achievement. Zimmerman and Allebrand (1965) studied urban fourth and fifth graders of middle to lower socio-economic status and found that poor readers tested on the California Test of Personality, lacked sufficient sense of personal worth, freedom, stability and adequacy to the extent that they avoided achievement. Bodwin (1959) found correlations of .72 for grade three and .62 for grade six subjects between reading disability and immature self concepts.

There are a few studies, however, that have found no significant relationship between reading and self concept. Williams (1973) investigated correlations of self concept and reading for 133 first grade students and found no significant correlation for the students' self concept and their first or second grade reading achievement. Butcher (1967) and Rushley (1970) also found no significant relationships between reading ability and self concept for elementary children.

Criticism of Existing Research

There are several weaknesses in the research done to date on the relationship between reading and self concept. The first is that most of this research has concentrated on students in the elementary grades, and little research has been done with high school students. A second weakness is that many of the conflicting results may be attributed to the use of self concept measures for which no adequate validity or reliability had been established and which, in many cases had been created expressly for the purpose of a particular study. A third weakness is that when different research studies use different measures of self concept and of reading ability, the results of these studies cannot be directly compared. In cases where the instrument to measure self concept had been created specifically for a particular study, the research study can also not be duplicated. A fourth weakness is that many of the studies, especially those done with high school students, were primarily interested in the underachiever and therefore worked only with high intelligence subjects rather than the normal range of students.

To date, no attempt has been made at a systematic study of the relationship between self concept and reading at different stages in a child's educational career, using one measure or correlated measures of reading, and one measure of self concept so that correlations of reading and self concept at different grade levels could be compared. This study sought to do this.

CHAPTER II

THE PROBLEM

The General Problem

Educators today are becoming more aware that each child is an individual, acting and reacting in his environment in different ways, and that teaching can therefore not be done to a class but must be done to each individual within a class. As a result, research regarding the nature of the influence that school has on each individual is important to educators. When a child first enters school there is generally a degree of pressure on him from his significant others (his parents and, to some extent, his teachers) to succeed in school. Since school success in early grades is measured to a large extent by achievement in reading, it can readily be seen that self concept (as a mirror of the perceived feelings of significant others) can be strongly influenced by success, or lack of it, in reading. But as a child advances in school, peers become more important as an influence on self concept, and peer group activities and attitudes, in school or outside school, become increasingly more influential. Often, this means that success in areas such as sports, clubs and social interactions or whatever else the peer group holds important is more influential on the self concept than reading disability. Also, as a child enters higher grades, he usually has the opportunity to take a much greater variety of courses, many of which do not place a great demand on reading ability for success (P.E., Home Economics, Industrial Arts, Secretarial

Courses, Band, Agriculture, Work Experience Programs). This is especially true in today's high schools which are stressing more and more that one of the main aims of education at that level is to provide each student with a chance to explore several areas of endeavor and to provide each student with some success in one of these areas. Such phrases as 'educate the whole child', 'individualization' and 'provide success experiences' currently used by educators, illustrate this feeling. When children are provided with success in areas other than reading, the fact that the child is a poor reader will probably not have as great an effect on his valuations of self.

This study sought answers to the following questions:

1) Are self concept and reading ability significantly correlated at various grade levels?
2) Are there significant differences between the correlations of self concept and reading ability for various grade levels?
3) Is there a significant difference between the group means on the self concept scale for good, average or poor readers within each grade level?
4) If there is a significant difference on self concept between good, average and poor reading ability groups, are these differences the same for each grade level or do they change as a child progresses through school?

In this study the variables of intelligence and socio-economic status were not built into the design. Several studies have found that there is no significant correlation of intelligence and self concept (Mayer, 1965; Wattenburg and Clifford, 1967; Hesse and Bradshaw, 1970). However, some studies have found some conflicting evidence and Coopersmith

(1967) obtained an overall correlation of .28 between self esteem and intelligence. Differences in correlations of intelligence and self concept in different groups may well depend on how well the child knows and accepts his own ability level. In this study, the basic interest is in reading performance and its relation to self concept, regardless of the individual's intelligence.

The majority of recent studies have found little or no relationship between the variable of self concept and socioeconomic status (Carter, 1968; Soares and Soares, 1969, 1971, 1973; Hess and Bradshaw, 1970; Trowbridge, 1970). Dennerell (1971) in a study with 208 fifth grade children found no significant differences in self concept by sex role or socioeconomic status.

Although the variable, sex of subjects, was not built into the design, it was controlled in the study by randomly selecting, where possible, equal numbers of boys and girls to each ability group.

Hypotheses

Hypothesis I - There will be no significant differences between correlations of reading achievement and self concept for grades three, five, seven, eight, ten and twelve.

$$H_o : r_3 = r_5 = r_7 = r_8 = r_{10} = r_{12}$$

Hypothesis II - There will be no significant differences between means on the self concept scale for groups of poor, average and good readers at various grade levels.

$$H_o : M_{ij} = M_{i'j} = M_{ij'} = M_{i'j'}$$

Definition of Terms

1) Self Concept - The self concept is an organization of images which an individual has about himself in his environment. These images develop over time from the reflected appraisal of others around him (Beatty, 1969). The self concept can be measured in terms of the positive or negative traits a person feels is part of his character. Self concept of the individuals in this study will refer to that person's obtained score on the Piers Harris Children's Self Concept Scale.

2) Reading Ability - The subject's reading ability will be his obtained score (total score) on the Nelson Reading Test, Revised Edition, Form A for grades three, five, seven and eight, or on the Nelson Denny Reading Test, Revised Edition, Form C, for grades ten and twelve.

   a) Good Reader - a student whose total score on the above reading tests falls on or above the 68th percentile for his grade.

   b) Average Reader - A student whose total score on the above reading tests falls on or above the 34th percentile for his grade but below the 68th percentile.

   c) Poor Reader - A student whose total reading score on the above tests falls below the 34th percentile for his grade.

CHAPTER III

GENERAL PROCEDURE

Subjects

All subjects came from schools in the Kamloops school district, a city with a population of approximately sixty thousand. The subjects came from three elementary schools, one junior secondary school and one senior secondary school. The elementary schools serve as feeder schools to the junior secondary school which serves as a feeder school for the senior secondary school. In this way, all subjects come from one population area. This area from which the subject were drawn is populated by people from a wide range of socioeconomic levels--from professional people such as doctors and lawyers, to welfare recipients. The majority of the population consists of predominantly middle class, working, white subculture.

Test Measures

1. Piers Harris Children's Self Concept Scale

The Piers Harris Children's Self Concept Scale was chosen for this study for several reasons. Although there are a large number of self concept and personality measures available today, most of these have several weaknesses. Some of these were created solely for specific research studies and were not tested for validity or reliability, or only minimumly tested. Many tests deal with multiple personality factors

and/or interests rather than solely with self concept.

A major concern of this study was to measure children's self concept at different grade levels, and in order to do this and be able to compare results, only one measure could be used for all grade levels. Unfortunately, many of the tests that have been more widely used are suitable only for the fifteen and over age group and are not suitable for younger students, and those designed for the young children are not suitable for secondary school students. The Piers Harris Children's Self Concept Scale is designed for use with grades three to twelve.

The Piers Harris Children's Self Concept Scale was originally standardized on 1183 students in grades four through twelve in one suburban school district. Several follow-up studies were later done. The internal consistency of the scale ranges from .78 to .93 and test-retest reliability ranges from .72 to .77. Correlates with similar instruments are in the mid-sixties and the scale possesses teacher and peer validity coefficients of about .40. The current reviews of this test in the Seventh Annual (Buros, 1972) Mental Measurements Yearbook terms the test as a 'psychometrically adequate scale' and gave it a favourable review for research purposes.

In grades three, five and seven the instructions and items for the test were read aloud by the examiner as the manual recommends. At the higher grades, only the instructions were read aloud. There was no time limit for responding to the questions.

The score on the Piers Harris Children's Self Concept Scale indicates the extent of positive self concept.

2. Nelson Reading Test, Revised Edition, Form A, (1972)

   Nelson Denny Reading Test, Revised Edition, Form C (1972)

One of the main concerns in choosing a reading measure was that the test would measure the same reading skills in the same way at different grade levels. There are no adequate reading tests on the market which allow one form to be used by students ranging from grade three to grade twelve. Most tests require that different forms be used for approximately every second or third grade level. The Nelson Reading Test and the Nelson Denny Reading Test were thus chosen partly because they spanned a larger number of grade levels with one form, thereby eliminating as much as possible a confounding due to different tests at different grade levels. Another reason these tests were chosen was that they measured two major factors of reading ability--vocabulary and comprehension--important to this study, and did not attempt to measure other skills such as grammar, spelling, alphabetizing or study skills, which were extraneous to this study. In this study, the Nelson Reading Test was used with students in grades three, five, seven and eight. The Nelson Denny Reading Test was used with students in grades ten and twelve. Both tests yield three scores--vocabulary, comprehension and total score. The Nelson Denny Reading Test also yields a rate score which was not used in this study.

The reliability for the Nelson Denny Reading Test total score is .92. The reliability for the Nelson Reading Test total score ranges from .88 to .93. The percentile norms for both of the reading tests, which were used in this study to assign students to ability reading ability groups, were carefully constructed, using a wide range and large number of students across all grade levels. Both tests received favourable reviews in the Seventh Annual Mental Measurements Yearbook (Buros, 1972).

In order to determine the correlation between the Nelson Reading Test and the Nelson Denny Reading Test forty-seven students in grade nine

received both tests. Their scores on the two reading tests yielded a correlation coefficient of .91.

The measures of reading and self concept were administered by one examiner. Both measures can be obtained commercially for use in any replication of this study.

General Design

All students in grades three, five, and seven of the elementary schools involved in this study were given the Nelson Reading Test. Because of the much greater number of students within each grade level for the junior and senior secondary schools, approximately one hundred and fifty students were randomly selected from each grade level to be tested with the Nelson Reading Test in grade eight or the Nelson Denny Reading Test in grades ten and twelve. In administering the reading tests, instructions from their respective manuals were followed.

For each student, a total reading score was calculated, and each of these scores were translated to a percentile ranking according to the norms in the appropriate test manual. Each of these students was then assigned to one of the following three groups--poor readers (1st to 33rd percentile), average readers (34th to 67th percentiles) or good readers (68th to 99th percentiles).

From each of these groups, at each grade level, twenty subjects were randomly selected, using random number tables (Marascuilo, 1971), to receive the Piers Harris Children's Self Concept Scale. The scale was administered to students before they were given their scores on the reading tests. A self concept score was then calculated for each student with each group and group means were calculated.

To test the first hypothesis, the raw scores for all students within all three groups at each grade level on the Piers Harris Children's Self Concept Scale and on the total reading score were correlated, and these correlations were tested for significant differences using the Z transformation and Chi square distribution for $\alpha = .05$. A computer program (Bjerring, 1975) was used to determine cell means for a three by six factoral design and to compute the analysis of variance table, with reading ability and grade level as independent measures and scores on the Piers Harris Children's Self Concept Scale as the dependent variable. This was followed by Scheffé tests to determine sources of significant effects of the independent variables and to determine significant interactions.

Sample Size

Original numbers of students to whom the reading tests were administered:

Grade 3	138
Grade 5	136
Grade 7	183
Grade 8	164
Grade 10	143
Grade 12	128
Total	892

Number of students receiving the self concept scale and used in research analysis:

Number of subjects in each group	20
Number of subjects in each grade	60
Total subjects in research study	360

CHAPTER IV

DATA ANALYSES AND RESULTS

In order to test the first hypothesis--that there are no significant differences between correlations of reading achievement and self concept for grades three, five, seven, eight, ten and twelve--the raw scores for each subject on the reading test and on the self concept scales were correlated for each grade level by computer program BMD:02D (Halm, 1970). The resulting correlation coefficients are given in Table 1.

TABLE 1

CORRELATION COEFFICIENTS FOR SELF CONCEPT AND READING SCORES

Grade	N	Correlation
3	60	.31**
5	60	.57**
7	60	.57**
8	60	.58**
10	60	.23*
12	60	.19

*correlation significant at the .05 level
**correlation significant at the .01 level

The correlations for grades three, five, seven, eight and ten were significant. The highest correlations were obtained for grades five, seven and eight, after which the correlations dropped until, for grade

twelve, the correlation was nonsignificant.

The correlations were then tested for significant differences using the z transformation and the chi square distribution for k independent values of r (Edwards, 1973):

$$\chi^2 = \sum_1^k (nk-3)\ zk^2 - \frac{[\sum_1^k (nk-3)\ zk]^2}{\sum_1^k (nk-3)}$$

$$= 14.43^*$$

* significant at the .02 level

The correlations for different grades were significantly different and the first hypothesis was rejected.

As the chi square test showed a significant difference, a Z transformation for r for individual grade correlations was computed to determine which grades were significantly different from other grades using the equation (Edwards, 1973):

$$Z = \frac{z_1 - z_2}{\sigma_{z_1 - z_2}}$$

where : $\sigma_{z_1-z_2} = \sqrt{\sigma^2_{z_1} - \sigma^2_{z_2}} = \sqrt{\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}}$

$$= .19$$

The results of these calculations are shown in Table 2.

From the results depicted in Table 2, it appears that the correlations for grades three, five, seven and eight are not significantly different from each other. However, each of these grades' correlations are significantly different from the correlations for grade ten and twelve which are also not significantly different from each other.

TABLE 2

SIGNIFICANCE OF DIFFERENCES BETWEEN CORRELATIONS OF READING AND SELF CONCEPT FOR PAIRS OF GRADES

GRADE	N	r	z_r
3	60	.31	.321
5	60	.57	.648
7	60	.57	.648
8	60	.58	.662
10	60	.23	.234
12	60	.19	.192

$Z_1 = z_5 - z_3 = 1.72$

$Z_2 = z_7 - z_3 = 1.72$

$Z_3 = z_8 - z_3 = 1.79$

$Z_4 = z_{10} - z_3 = -.46$

$Z_5 = z_{12} - z_3 = -.68$

$Z_6 = z_7 - z_5 = 0$

$Z_7 = z_8 - z_5 = .07$

$Z_8 = z_{10} - z_5 = -2.18^*$

$Z_9 = z_{12} - z_5 = -2.40^*$

$Z_{10} = z_8 - z_7 = .07$

$Z_{11} = z_{10} - z_7 = -2.18^*$

$Z_{12} = z_{12} - z_7 = -2.40^*$

$Z_{13} = z_{10} - z_8 = -2.25^*$

$Z_{14} = z_{12} - z_8 = -2.47^*$

$Z_{15} = z_{12} - z_{10} = -.22$

*significantly different at the .05 level

In order to test the second hypothesis that there were no significant differences between means on the self concept scale for groups of poor, average and good readers at various grade levels, the subjects' scores on the Piers Harris Children's Self Concept Scales were analyzed by computer program BMD:10V (Bjerring, et al, 1975). The resulting means and standard deviations for each group on the dependent measure, self concept, are given in Table 3. The total means for each grade and for each total ability group are also given in the table.

TABLE 3

MEANS AND STANDARD DEVIATIONS ON SELF CONCEPT SCALE FOR READING GROUPS BY GRADE LEVEL

	POOR n=20		AVERAGE n=20		GOOD n=20		TOTAL n=60	
	M	S.D.	M	S.D.	M	S.D.	M	S.D.
GRADE 3	52.50	10.27	51.95	11.72	60.60	8.48	55.02	10.83
GRADE 5	45.75	13.40	51.30	11.95	65.05	9.95	54.03	14.23
GRADE 7	50.35	12.99	60.25	8.55	66.90	7.18	59.17	11.90
GRADE 8	47.45	9.75	51.60	10.89	64.00	6.84	54.35	11.58
GRADE 10	52.50	7.94	53.00	7.20	55.25	11.51	53.58	9.00
GRADE 12	53.00	9.90	57.70	12.07	55.70	12.15	55.47	11.39
	n=120		n=120		n=120		n=360	
TOTAL	50.26	11.00	54.30	10.90	61.25	10.40	55.27	11.66

An analysis of variance for the six by three factoral design with the two independent variables of reading ability and grade level and the dependent variable as positive self concept score was also calculated by the same computer program. The results are given in Table 4.

TABLE 4

ANALYSIS OF VARIANCE TABLE FOR THE THREE BY SIX FACTORAL DESIGN

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F	PROB.
ABILITY	7418.2	2	3709.1	34.61078	.0000
GRADES	1230.4	5	246.09	2.29635	.0450
INTERACTION	3517.6	10	351.76	3.28239	.00049
WITHIN TREATMENT	36651.0	342	107.17		

The above results show that all three sources of variance--ability, grades and interaction were significant at the .05 level. Therefore the second null hypothesis

$$H_o : M_{ij} = M_{i'j} = M_{ij'} = M_{i'j'}$$

was rejected.

A graph of the interaction of grades and ability is given in Figure 1. This graph shows the interaction that was proved significant in the ANOVA table. The graph also shows that the spread between good and poor and good and average readers in terms of positive self concept is greater at the lower grade levels than at the grade ten and twelve grade levels, where the spread is only three to five points. In grade twelve, the good reading ability mean score is lower than the average reading ability mean score.

Since the ANOVA table showed a significant effect for ability, a Scheffé test was used to determine at which grade levels the difference between reading ability groups was statistically significant. The following equation was used in the calculations and the results are presented in Table 5 (Glass and Stanley, 1970).

$$\Psi \pm \sqrt{MS_w \left(\frac{c_1^2}{n} + \frac{c_2^2}{n} + \ldots + \frac{c_j^2}{n}\right)} \sqrt{(I-1)F_{I-1,N-IJ}} \qquad 1-.95$$

The difference between means for the good and poor reading ability groups was significant for grades three, five, seven and eight. The difference between means for good and average reading ability groups was also significant for grades three, five and eight.

To locate the main effects of ability, the main effects of grade and the main effects of the interaction with the effects of grade and ability removed, the unknown parameters for the three by six factoral

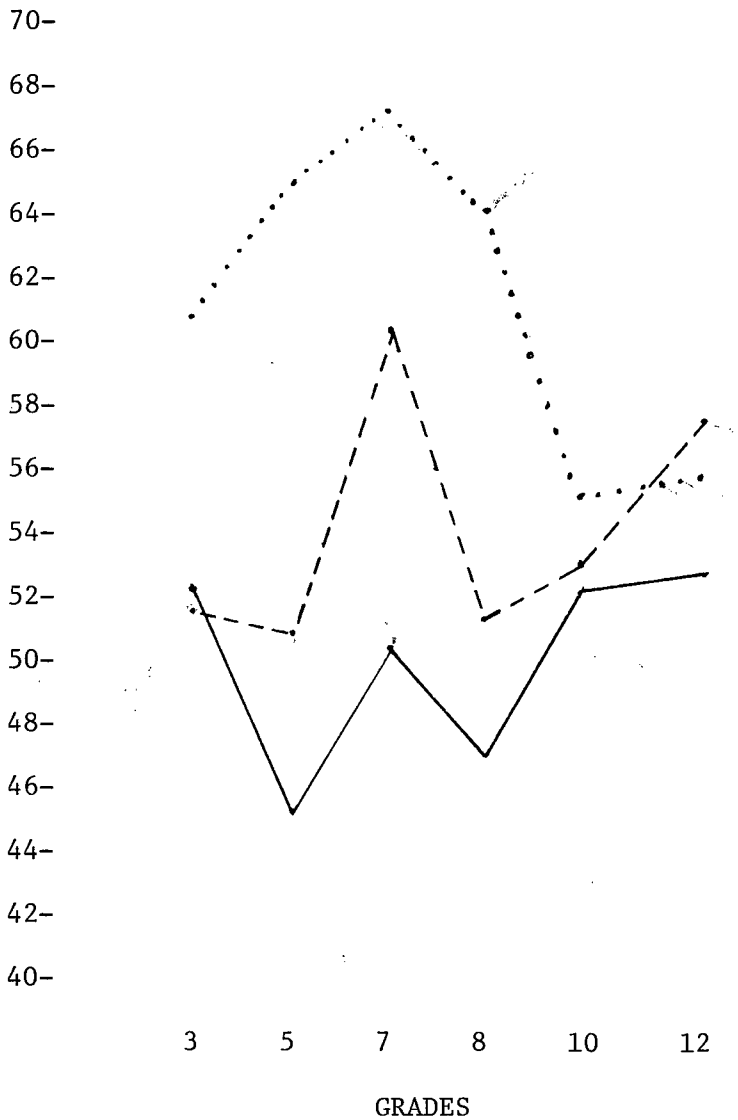

FIGURE 1: Graph of interactions of grade and reading ability on self concept

TABLE 5

DIFFERENCES BETWEEN MEANS WITHIN EACH GRADE FOR THE EFFECTS OF READING ABILITY

GRADE	GOOD-AVERAGE	GOOD-POOR	AVERAGE-POOR
3	8.65*	8.10*	-.55
5	13.75*	19.30*	5.55
7	6.65	16.55*	9.90*
8	12.40*	16.55*	4.15
10	2.25	2.75	.50
12	-2.00	2.70	4.70
TOTAL	6.95	10.99*	4.04

*significant at the .05 level

design were calculated using the data from Table 3. These unknown parameters are recorded in Table 6.

TABLE 6

TABLE OF UNKNOWN PARAMETERS FOR THE 3 × 6 FACTORAL DESIGN

	ABILITY			MAIN
GRADE	POOR	AVERAGE	GOOD	EFFECT
GRADE 3	2.49	-2.10	-.40	-.25
GRADE 5	-3.27	-1.76	5.04	-1.24
GRADE 7	-3.81	2.05	1.75	3.90
GRADE 8	-1.89	-1.78	3.67	-.92
GRADE 10	3.93	.39	-4.31	-1.69
GRADE 12	2.94	3.20	-5.75	.20
MAIN EFFECT	-5.01	-.197	5.98	

The unknown parameters were calculated in respect to the grand mean. For example, on the basis of the data in Table 3 and Table 6 it is found that within rounding errors

1. (effect of ability poor) $= \bar{y}_{i.} = \bar{y}_{..} = 50.26 - 55.27 = -5.01$

2. (effect of grade 3) $= \bar{y}_{.j} - \bar{y}_{..} = 55.02 = 55.27 = -.25$

3. (effect of interaction, poor ability × grade 3)

$$= \bar{y}_{ij} - \hat{\alpha}_i - \hat{\beta}_j - y_{..}$$

$$= 52.5 \pm 5.01 + .25 - 55.27$$

$$= 2.49$$

From the above table confidence intervals were established, using the Scheffé test to determine which treatment effects were significantly different from zero, relative to the grand mean. The three calculations for significant differences follow (Marascuilo and Levin, 1970):

A. Calculations for confidence intervals around individual α_i used to determine which treatment effect of ability was significantly different from zero, using the equation:

$$\alpha_i = \hat{\alpha}_i \pm S\ SE_{\hat{\alpha}_i}$$

where $S^2 = (I-1)F_{I-1,IJ(N-1)}\ ^{1-.95}$

$$SE\hat{\alpha}^2 = \frac{I-1}{J}\ \frac{MS_E}{J.N}$$

$$\alpha_i = \hat{\alpha}_i \pm 1.90 \text{ (critical value)}$$

Main effects for ability

$\alpha_1 = 5.61^*$

$\alpha_2 = -.97$

$\alpha_3 = 5.98^*$ * significant at the .05 level

According to the calculations, two levels of ability (poor and good) provide significant sources of variation relative to the grand mean since the estimated treatment effects were larger in absolute value than 1.90.

B. Calculations for confidence intervals around individual β_j used to determine which treatment effect of grade were significantly different from zero, using the equation:

$$\beta_j = \hat{\beta}_j \pm S\ SE_j$$

where $S^2 = (J-1)F_{J-1,IJ(N-1)}^{1-.95}$

and $SE^2_{\beta_j} = \frac{J-1}{J}\ \frac{MS_E}{I.N}$

$$\beta_j = \hat{\beta}_j \pm 4.09$$

From Table 7 the main effects for grade are:

$\beta_3 = .25$ $\beta_5 = 1.24$ $\beta_7 = -3.90$ $\beta_8 = .92$ $\beta_{10} = 1.69$ $\beta_{12} = -.20$

Therefore no simple level of grade relative to grand mean represents significant sources of variation since each estimated treatment effect was smaller in absolute value than 4.08.

C. Calculations for confidence intervals around each cell interaction with the effects of grades and ability removed, used to determine which interaction effects were significantly different from zero relative to grand mean.

$$Y_{ij} = \hat{Y}_{ij} \pm S\ E_{Yij}$$

$$= \hat{Y}_{ij} \pm 7.41$$

where

$$S^2 = (I-1)(J-1)\ F^{1-\alpha}_{(I-1)(J-1),\ IJ(N-1)}$$

$$SE^2_{\hat{Y}ij} = \frac{(I-1)(J-1)}{IJ}\ \frac{MS_E}{N}$$

Therefore no simple combinations of grades and ability were solely responsible for the significant F-ratio for interaction in the analysis of variance table as not even the largest $\hat{Y} = -5.75$ was outside the confidence interval.

Since the Scheffé is considered a very conservative test and since simple interactions have not proved significant, Marascuilo and Levin (1970) suggest that an investigation of contrasts involving two or more interactions would be necessary to identify reasons for rejection. In order to find these significant interactions the data were re-analyzed using the calculations suggested by Marascuilo and Levin.

One of the main questions of this study was concerned with whether the self concept in early grades varied more with the reading ability than in the higher grades (i.e., the spread between means for good/poor or good/average or average/poor was greater at some grade levels than the corresponding spread in other grade levels). Therefore, these relationships were first investigated for pairs of grades.

The following table presents the tetrad differences between ability groups for different grade levels.

$$\text{i.e., } \Psi = (\bar{Y}_{ij} - \bar{Y}_{ij'}) - (\bar{Y}_{i'j} + \bar{Y}_{i'j'})$$

The Scheffé equation (Marascuilo and Levin, 1970) was used to establish confidence intervals around the tetrad differences.

$$\Psi_{AB} = \hat{\Delta}_i - \hat{\Delta}_{i'} \pm S\ SE_{\hat{\Delta}i-\hat{\Delta}i'}$$

The table shows no statistically significant differences between pairs of means between any two grades, as none reached the critical value of 20.02.

The simple tetrad differences were proved to be not significant, yet, according to Scheffé's Theorem, if the initial test of hypothesis is

TABLE 7

TABLE OF TETRAD DIFFERENCES FOR SPREAD OF MEANS BETWEEN TWO ABILITY GROUPS FOR PAIRS OF GRADES

DIFFERENCE BETWEEN GRADES	GOOD-AVERAGE	GOOD-POOR	AVERAGE-POOR
3- 5	-5.10	-11.20	-.61
3- 7	2.00	-8.45	-10.45
3- 8	-3.75	-8.45	-4.70
3-10	6.40	5.35	-1.05
3-12	10.65	5.40	-5.25
5- 7	7.10	2.75	-4.35
5- 8	1.35	2.75	1.40
5-10	11.50	16.55	5.05
5-12	15.75	16.60	.85
7- 8	-5.75	0	5.75
7-10	4.40	13.80	9.40
7-12	8.65	13.85	5.20
8-10	10.15	13.80	3.65
8-12	14.40	13.85	-.55
10-12	4.25	.05	4.20

significant there must also exist some related contrasts which are also significant. Marascuilo and Levin (1970) suggest that the researcher then collapse over cells in meaningful ways to produce more complex contrasts in differences. Since part of the original problem was to contrast the relation between reading and self concept at the lower grades with the corresponding relationships at the higher grades, the collapsing of cell means was done in three different ways to set up three different ways of comparing lower versus higher grades. The first comparison was between the three lower grades and the three higher grades (3,5,7:8,10,12).

Because many of the opportunities for students to specialize in programs start after grade eight, and since involvement in school activites, other than classes, often become greater after the first year in high school a second comparison was made between the four lower grades (3,5,7, and 8) and the two senior grades (10 and 12). A third comparison was then made between the two lower grades and the two middle grades and the two upper grades (3,5:7,8:10,12).

The computer program, BMD:10V, (Bjerring et al, 1975) was used to calculate means, standard deviations and ANOVA tables for each of the above contrasts, (these are presented in Appendix B), and the results were analyzed by the Scheffé equation to test for significant differences of interaction (Marascuilo and Levin, 1970).

$$\Psi_{AB} = \hat{\Delta}_i = \hat{\Delta}_{i'} \pm S\ SE_{\hat{\Delta}i - \hat{\Delta}i'} \qquad \alpha = .05$$

The calculations for each grouping follows.

A. Calculations for grades 3,5,7 vs. 8,10,12.

Differences between means of ability groups for each level of grades.

	GOOD-POOR	GOOD-AVER.	AVER.-POOR
grades 3,5,7	14.65	9.68	4.97
grades 8,10,12	7.34	4.22	3.12
TETRAD DIFFERENCES			
(3,5,7) - (8,10,12)	7.31*	5.46	1.85

The critical value by the Scheffé equation was 6.30. Therefore differences for means of good readers from means of poor readers for lower grades 3,5,7, was significantly different from those differences for upper grades, 8,10,12.

B. Calculations for grades 3,5,7,8 vs. 10,12.

Differences between means of ability groups for each level of grades.

	GOOD-POOR	GOOD-AVER.	AVER.-POOR
grades 3,5,7,8	15.13	10.37	4.77
grades 10,12	2.72	.12	2.60
TETRAD DIFFERENCES			
(3,5,7,8) - (10,12)	12.41**	10.25**	2.16

The critical value by the Scheffé equation was 2.71. Therefore the averaged means for grades 3,5,7,8 were significantly different from the averaged means for grade 10 and 12 in differences between

good and poor readers

good and average readers

at $\alpha = .01$.

C. Calculations for grades 3,5 vs. 7,8 vs. 10,12.

Differences between means of ability groups for each level of grades.

	GOOD-POOR	GOOD-AVER.	AVER.-POOR
grades 3,5	13.70	11.20	2.50
grades 7,8	16.55	9.53	7.02
grades 10,12	2.72	.12	2.60
TETRAD DIFFERENCES			
(3,5) - (7,8)	-3.85	1.67	4.52
(3,5) - (10,12)	10.98	11.08*	-.10
(7,8) - (10,12)	13.83*	9.41	4.42

The critical value of the Scheffé equation is 10.23. Therefore the spread between means of good and poor readers was not significantly different for grades (3,5) from (7,8) but was significant between each

of these grade level groups and grades (10,12). The spread between good and average readers for grades (3,5) was significantly different from the corresponding spread for grades (10,12).

CHAPTER V

CONCLUSIONS

Summary

The purpose of this study was to determine if reading ability was related to self concept and to what extent they were related at various grade levels. Previous studies had shown a positive relationship in primary grades where most research had been concentrated, but little research had been done using the normal range of high school students. Furthermore, most studies used different measures of self concept and of reading ability so that it was difficult to compare the results of different studies. This study is unique in that it takes groups of good, average and poor readers in intermediate and secondary grades to study the relationship between reading and self concept, using one measure of self concept and correlated measures of reading ability.

The subjects who participated in this study were 360 students in grades three, five, seven, eight, ten and twelve in one school district. There were sixty students in each grade level--twenty good, twenty average and twenty poor readers, as determined by subjects' scores on the Nelson Reading Test or the Nelson Denny Reading Test. Each of these subjects responded to the Piers Harris Children's Self Concept Scale which yielded a score indicating positive self concept.

The data were analyzed in order to accept or reject two hypotheses: 1) There will be no significant differences between correlations of

reading and self concept for grades three, five, seven, eight, ten and twelve.

2) There will be no significant differences between means on the self concept scale for groups of poor, average and good readers at various grade levels.

The first hypothesis was tested by correlating raw scores on the reading tests with self concept scores at each grade level. Correlations were subjected to post hoc tests to find significant differences. The second hypothesis was tested within a three by six factoral design. An analysis of variance was done followed by Scheffé tests to find the significant differences for levels of main effects and for significant interactions between means and between pairs of means.

Conclusions and Discussion

Both of the null hypotheses posed in this research study were rejected so that:

$$H_o : r_1 \neq r_2 \neq \ldots \neq r_k$$

$$H_o : M_{ij} \neq M_{i'j'}$$

Several questions were posed as part of the research problem. The first question asked if reading and self concept were positively correlated at any of the six grade levels studied. Correlations were positive and significant for grades three, five, seven, eight and ten but as not significant for grade twelve. The second question asked whether there were significant differences between the correlations of reading ability and self concept for the various grade levels. The statistical analysis showed that there was a significant difference. Furthermore, it appeared from the data that reading ability and self concept were most highly

correlated at the middle grades (five, seven and eight) and that this correlation dropped as children progressed through high school so that the correlation for grade twelve was not significant.

The third question asked whether there were significant differences between group means for different ability groups within each grade, and whether these differences varied significantly from grade to grade. From the analyses of data, it appeared that there were significant differences between the self concept of good and poor readers at the grades three, five, seven and eight levels, but that these differences decreased by grade ten and were not significant for grade twelve. The differences between the self concept of good readers and the self concept of poor readers were greatest for grades five, seven and eight.

Some data from this study appear to conflict with the majority of data from previous research studies, which generally showed higher correlations between reading scores and self concept scores for primary grades than for higher grades. The data from this study show a lower, although significant and positive, correlation for grade three than for grades five, seven and eight. One can only conjecture on causes for this discrepancy, but two factors may help to explain this. The first is that according to the grade three teachers, the majority of poor readers in the primary grades are not as yet aware of their poorer level of reading ability compared to the average readers, for two reasons. One is that the actual reading lessons are usually done in readers written for different reading ability levels. Secondly, in grade three there is not yet an emphasis on reading skills to succeed in other subject areas such as social studies, science and even math. However, good readers, because they tend to read more often and may be given the opportunity to do more reading oriented

projects in other subject areas, do realize their ability differences.

The other possible cause for the discrepancy is that both grade three poor readers and grade five poor readers had unequal numbers of boys (11) and girls (9) in each cell. This was due to the fact that in both grade three and in grade five, the boys outnumbered the girls in total grade, poor reading groups. As the mean self concept for girls in the grade three poor reading cell is lower than that for the boys, the total group mean may have been lower had the number of girls and boys been even (see Appendix A).

The data in this study do not, of course, show what factors influence the relationship between reading ability and self concept at the different grade levels or why the correlations between these variables decrease as the child reaches the upper grades. However, several ideas are presented here which might account for the changes.

When a child enters school he is very much concerned with success in school, mainly as a reflection of the concerns of his parents and, to some extent, his teachers (the significant others). In the early grades success in reading is a large part of the measure for success in school. Also, most of the child's concern in school is with in-class work.

As the child grows older he may become more involved in other after school or peer group activities, especially if he is not attaining much success with academic activities. This involvement with activities not related to academic achievement becomes more important as the child grows older, so that in adolescence, peer acceptance is often as, or more, important than success in school subjects. For example, a boy who is star of the basketball team or who plays in a local rock band on weekends will probably regard these activities and the peer status they bring as more

important than good reading ability and success in academic subjects.

As well as this, the student can, when he reaches high school, elect more courses each year on the basis of personal interest--ones for which reading skill is not prerequisite for success. Students in grade eight in British Columbia are still, for the most part, heterogeneously grouped and required to take Math, English, Social Studies, Science and French, generally without any appreciable streaming for ability. However, after grade eight, students are often streamed by ability, whether into academic, vocational, occupational or work experience programs or into levels one, two and three, based on achievement. As the student advances through the secondary grades he has to take fewer required courses each year until, in grade twelve, English 12 is the only required course and all other subjects may be elected from his own vocational interest areas (Industrial Arts, Community Service, Secretarial Arts, Food Services, Fine Arts or Academic courses). By grade nine or ten, students also become much more involved with peer oriented pursuits such as sports, students' counsel, part time jobs and social activities in which they may attain success. Certainly the fact that schools today aim more than ever before at providing success experiences for each individual will have its effects on the self concepts of those individuals.

Suggestions for Future Research

The results of this study suggest several areas in which further research may be directed. Since the validity of any measure of a construct such as self concept is always in question to some extent, a replication of this study might be done using a different measure of self concept--either another self report measure or a teachers' or peers'

rating scale or a combination of the two.

As the correlations for reading and self concept for grades five, seven and eight were very similar and the drop in correlations appears, from this data, to occur after grade eight, a similar study might be done with grades eight, nine, ten, eleven and twelve, to see where and how the correlations vary within these grades and to ascertain where the correlations decrease through the secondary grades.

A third area towards which research may be directed is a study over time, testing the same students in grade eight, grade ten and grade twelve, to see how the group means for these students change as they progress through school, especially the change in self concept for poor and good readers.

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APPENDIX A Factoral Design for Grades vs. Ability vs. Sex on Dependent Variable Self Concept

		Ability							
Grade	Sex	Poor	N	Average	N	Good	N	Total	
	F	45.33	9	50.20	10	59.40	10	51.86	55.02
3	M	58.36	11	53.70	10	61.80	10	57.97	
	F	40.87	9	49.50	10	61.40	10	50.93	54.03
5	M	49.73	11	53.10	10	68.70	10	56.94	
	F	50.20	10	58.80	10	68.50	10	59.17	59.17
7	M	50.50	10	61.70	10	65.30	10	59.17	
	F	47.60	10	51.40	10	62.50	10	53.83	54.35
8	M	47.30	10	51.80	10	65.50	10	54.87	
	F	52.70	10	51.20	10	49.10	10	51.00	53.47
10	M	52.30	10	54.80	10	61.40	10	56.17	
	F	53.90	10	53.60	10	53.80	10	53.77	55.47
12	M	52.10	10	61.80	10	57.60	10	57.17	
	F	48.62	58	52.45	60	59.12	60	53.45	
TOTAL	M	51.79	62	56.15	60	63.38	60	57.05	
GRAND TOTAL		50.26	120	54.30	120	61.25	120		55.27

Analysis of Variance Table for Grades vs. Ability vs. Sex on Dependent Variable Self Concept

Source	Sum of Squares	D.F.	Mean Square	F	Probability
Ability	7629.4	2	3814.7	36.76743	.000
Grades	1261.3	5	252.26	2.43138	.03493
Sex	1263.0	1	1263.0	12.17359	.00055
Interaction Ability × Sex	14.741	2	7.3705	0.07104	.93144
Interaction Ability × Grade	3512.7	10	351.27	3.38567	.00035
Interaction Grade × Sex	571.25	5	114.25	1.10118	.35961
Interaction Total	1193.3	10	119.33	1.15011	.32394
Error	33616.	324	103.75		

There is no significant interaction for ability and sex or for grade and sex in total design.

APPENDIX B Means, Standard Deviations, N's, and Analysis of Variance Tables from Computer Program BMD:10V Analysis of Ability Groups Collapses over Grades

I. Grades 3,5,7 versus 8,10,12

Grades		Poor	Average	Good	Total
3,5,7	Mean	49.53	54.50	64.18	56.07
	N.	60	60	60	180
	S.D.	12.42	11.43	8.87	12.53
8,10,12	Mean	50.98	54.10	58.32	54.47
	N.	60	60	60	180
	S.D.	9.43	9.43	10.03	10.69

ANOVA Table

Source	Sum of Squares	D.F.	Mean Square	F.	Probability
Ability	7418.2	2	3709.1	32.58244	.0000
Grades	232.00	1	232.00	2.03803	.15429
Interaction	868.41	2	434.20	3.81425	.02297
Error	40298.	354	113.84		

II. Grades 3,5,7,8 versus 10,12

Grades		Poor	Average	Good	Total
3,5,7,8	Mean	49.01	53.77	64.14	55.64
	N.	80	80	80	240
	S.D.	11.78	11.30	8.37	12.30
10,12	Mean	52.75	55.35	55.47	54.52
	N.	40	40	40	120
	S.D.	8.87	10.10	11.68	10.27

Appendix B, continued

ANOVA Table

Source	Sum of Squares	D.F.	Mean Square	F	Probability
Ability	4291.7	2	2145.9	19.49821	.0000
Grades	99.756	1	99.756	0.90643	.34171
Interaction	2339.9	2	1170.0	10.63089	.00003
Error	38959.	354	110.05		

III. Grades 3,5 versus 7,8 versus 10,12

Grades		Poor	Average	Good	Total
3,5	Mean	49.12	51.62	62.82	54.52
	N.	40	40	40	120
	S.D.	12.27	11.68	9.40	12.60
7,8	Mean	48.90	55.92	65.45	56.76
	N.	40	40	40	120
	S.D.	11.43	10.61	7.08	11.94
10,12	Mean	52.75	55.35	55.47	54.52
	N.	40	40	40	120
	S.D.	8.87	10.10	11.68	10.27

ANOVA Table

Source	Sum of Squares	D.F.	Mean Square	F	Probability
Ability	7418.2	2	3709.1	33.85895	.00000
Grades	399.02	2	199.51	1.82127	.16335
Interaction	2549.3	4	637.32	5.81790	.00015
Error	38450.	351	109.55		