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SELF CONCEPT AND ACHIEVEMENT AMONG ELEMENTARY
STUDENTS IN AN EXPERIMENTAL PROGRAM

by

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Bachelor of Science, University of Wisconsin-River Falls 1958
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A Dissertation

Submitted to the Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

Doctor of Education

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IN AN EXPERIMENTAL PROGRAM

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Date Sept 13, 1972

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ABSTRACT

Problem

The main purpose of this study was to investigate the direction and degree of relationship between self concept and academic achievement among elementary students in an experimental program. A second purpose was to determine the amount and direction of change in the teachers' perception of the students.

Procedure

The research population was selected from students and staff in the Carl Ben Eielson and Nathan Twining Elementary Schools, in Grand Forks, North Dakota during the 1971-72 school year. These schools were participating in an experimental project, entitled Human Awareness through Self Enhancing Education (HATSEE), which was designed to enhance self concept and attitudes of students and staff.

The sources of data for this study were the Self Appraisal Inventory, the School Sentiment Index, the Class Play, the What Would You Do?, the Iowa Test of Basic Skills, and the Ideal Child Checklist. These instruments were administered to the research population early in the fall and late in the spring of the school year.

The statistical procedures employed in this study consisted of Pearson product-moment correlations, canonical correlations, and related t tests. The .01 and .05 levels were used for interpreting and evaluating the significance of the findings.

Findings

1. There was a significant difference among students between initial testing and retesting of self concept, on the variables peer (SAI), family, school, general, composite (SAI), peer (SSI), composite (SSI), and Class Play in third grade; school in fourth grade; peer (SAI), family, composite (SAI), subject, and Class Play in fifth grade; learning in sixth grade; structure in seventh grade; and structure in eighth grade.

2. There was a significant difference among students between initial testing and retesting of academic achievement, on the variables reading, language, arithmetic, and composite in third grade; reading in fourth grade; vocabulary and composite in fifth grade; and reading in sixth grade.

3. There was a significant positive canonical correlation between self concept and academic achievement on the initial tests for grades three, five, six, seven, and eight.

4. There was a significant positive canonical correlation between self concept and academic achievement on the retests for grades four, five, six, seven, and eight.

5. There was a significant difference between initial testing and retesting of the teachers' perception of the students, on the characteristics affectionate, remember well, guessing, self sufficient, never bored, talkative, and conforming. The remaining 59 characteristics were non-significant.

Conclusions

1. During the school year the greatest changes in school self concept occurred at the third and fifth grade level. The significant

changes in self concept were negative for third grade except for the Class Play and negative for fifth grade except for the family variable.

2. Significant changes in self concept for grades three, four, and five were indicated primarily by the Self Appraisal Inventory and the Class Play. The significant changes in self concept for grades six, seven, and eight were indicated primarily by the School Sentiment Index.

3. In grades three, four, and five there was an increasing number of positive, but not necessarily significant, t values on the self concept variables corresponding to the students increase in age. The same trend occurs with grades six, seven, and eight.

4. The adjusted t values for all the variables of the Iowa Test of Basic Skills were positive for grades three and five, but generally negative for grades four, six, seven, and eight.

5. On both the initial tests and retests the significant zero-order correlations between the ten self concept and five achievement variables were positive except for learning.

6. On both the initial tests and retests the zero-order correlations seem to indicate that the school scale on the Self Appraisal Inventory is the best single self concept predictor of academic achievement as measured by the Iowa Test of Basic Skills.

7. The teachers as a group changed very little, as measured by the Ideal Child Checklist, in their perception of desirable and undesirable characteristics of students.

CHAPTER I

INTRODUCTION

Background

Two major questions educators confront regarding innovation and reform are "What content is most meaningful to youngsters?" and "How can we teach it most effectively?"

Historically, the emphasis in education has been on the means: How can control of the class be achieved and maintained? How can the teacher make contact with the children? And, especially, how does one teach them a particular subject?

As a result, research in educational programs have tended in the past to emphasize the cognitive domain and the related aspects of curriculum, organizational structure, and staffing. One reason for this emphasis is the availability and relative ease of constructing and standardizing measures of the cognitive domain. Also, the public is more likely to accept an innovation or reform as being successful if it improves the "basic skills" of the students. These measures have been used to establish, justify, and perpetuate the cognitive emphasis in curriculum, organization structure, and staffing of educational programs.

More recent concerns in education include a consideration of the affective domain and the self concept of the students involved. Whether educators approve of teaching for a positive self concept in

the public schools, the student's self concept is affected by his school experience. Therefore, the school cannot escape the fact of its influence upon the student's self concept of their ultimate responsibility with respect to the positive or negative effects created by the school. If the public schools are to accept the responsibility for their effect upon the self concept, it is clear that consideration of this area should be given in the classroom. The effect of schooling upon the student's self concept in the affective domain should be recognized as important and is likely related to the acquisition of the knowledge of subject matter in the cognitive domain.

Purkey (1970) has observed that since 1960 there has been a fresh and invigorating amount of research into the relationship between the self concept and academic achievement. Researchers in the affective domain have endeavored to determine the direction and the degree of relationship between self concept and academic achievement. Studies showing that achievers (underachievers) have a high (low) self concept include Shaw, Edison, and Bell (1960), Fink (1962), and Brookover, Patterson, and Thomas (1964). Some studies, such as Campbell (1965), Bledsoe (1967), and Baum (1968) have shown that sex differences affect the degree of the correlation; correlations with girls are generally lower than with boys.

However, there are many unanswered questions about the relationship between self concept and academic achievement. This is particularly true with some minority and disadvantaged groups, where students with high self concepts often fail in school. The findings that minority and disadvantaged students, failing in school, do not necessarily have low self concepts is confirmed in studies by Soares and Soares (1969).

Kerensky (1967), and Carter (1968). On the other hand, in a study of minority students, Caplin (1966) found a positive correlation between self concept and academic achievement.

While the many studies done since 1960 show that some relationship between self concept and academic achievement exists, cause and effect have not been clearly shown. Purkey (1970) concluded that there is a consistent relationship between the self and academic achievement. However, caution is needed before one assumes that either the self concept determines academic achievement or that academic achievement shapes the self concept. While the relationship between the two may be caused by some factor yet to be determined, Purkey feels that the evidence suggests a continuous interaction between self concept and academic achievement and that each directly influences the other.

Most of the studies cited have taken place in an existing educational environment and attempted to measure the degree of self concept against known levels of achievement. By contrast, the purpose of this study was to determine the relationship between self concept and academic achievement in an environment designed to influence and improve students' self concept by changing teacher attitudes and behavior.

In Grand Forks, North Dakota, where this research was conducted, two elementary schools were funded by the United States Office of Education for a pilot project in the development and improvement of student self concept. The two schools involved in the project, during the 1971-72 school year, were the Carl Ben Eielson and Nathan Twining Elementary Schools. These schools were located adjacent to the Grand Forks Air Base and served the children of those military personnel living on or near the base. The project was entitled Human Awareness through Self

Enhancing Education (HATSEE) and followed the twelve general processes (see appendix) as outlined by Randolph and Howe (1966) in their book Self Enhancing Education: A Program to Motivate Learning. These processes were developed by the authors through action research in a Self Enhancing Education (SEE) program that has continued since 1957 in the Cupertino Union Elementary School District, Cupertino, California.

The project emphasis in the Grand Forks HATSEE program was directed at enhancing the self concept of the school children by modifying the teacher-student relationship via inservice training of the professional staff. One of the SEE authors (Norma Randolph) was present during the opening session to introduce the processes to selected staff members and to assist the project directors in organizing the total HATSEE program. The inservice program was then continued throughout the year by the project directors.

This study was undertaken in an attempt to determine the relationship between self concept and academic achievement and to investigate the relative stability of the teachers' perceptions of the students. The objectives assessed and the instruments used in this study represent only a portion of the evaluation of the HATSEE program.

Statement of the Problem

The main purpose of this study was to investigate the direction and degree of relationship between self concept and academic achievement of students in two Grand Forks Public Schools, during the 1971-72 school year. Areas which were of specific interest included: (1) student attitudes about himself, (2) student attitudes toward school, (3) student attitudes towards teachers, (4) student attitudes toward peers, and

(5) student attitudes toward family. A second purpose was to determine the amount and direction of change in the teachers' perception of the students during that year.

Research Questions

In this study the present writer has endeavored to answer the following research questions:

1. Is there a difference in initial testing and retesting of self concept among students in the participating schools?
2. Is there a difference in initial testing and retesting of academic achievement among students in the participating schools?
3. Is there a positive correlation between self concept and academic achievement on the initial tests among students in the participating schools?
4. Is there a positive correlation between self concept and academic achievement on the retests among students in the participating schools?
5. Is there a difference in the initial testing and retesting of teacher perception of the students in the participating schools?

Delimitations

The following comprise delimitations of the problem under investigation:

1. This study was concerned with students attending and staff employed by two public schools participating in a "Human Awareness through Self Enhancing Education" project. These

schools were Carl Ben Eielson Elementary and Nathan Twining Elementary which are located on the Grand Forks Air Base at Grand Forks, North Dakota.

2. Only those students in grades three through eight were included in this study.
3. Only those students attending their respective school for the entire 1971-72 school year were included in this study.
4. Students who did not complete all initial tests and retests were not included in this study.

Limitations

1. The findings of this study were limited by the reliability and validity of the instruments used to measure student self concept, namely, the Instructional Objectives Exchange School Sentiment Index (SSI), Self Appraisal Inventory (SAI), Class Play (CP), and What Would You Do? (WWYD).
2. The findings of this study were limited by the reliability and validity of the instrument used to measure academic achievement, namely, the Iowa Tests of Basic Skills (ITBS).
3. The findings of this study were limited by the reliability and validity of the instrument used to measure the teacher perception of the students, namely, the Torrance Ideal Child Checklist (ICC).
4. The findings of this study were limited by any differences in the organizational structure and staffing of the two schools.

Significance of the Study

It is becoming increasingly evident that much of the influence on school success is not a direct result of the academic experiences provided. It appears that student attitudes toward teachers, school, peers, and parents plays a significant role in the development of the student and his success in school. In particular, the student's concept of himself in relation to the total school environment is a major factor in determining student success in school.

Consequently, many present or proposed innovative educational programs have as their basic premise the improvement of student self concept, through reorganization of the school environment. These programs include changes in physical facilities, staff, curriculum, and teaching methods. In this period of time, when students, parents, and educators are demanding relevance in education and a better rate of success with the students, it is important that teachers recognize the effect of their attitude and behavior, as it relates to the students' self concept and academic achievement.

Definition of Terms

Self Concept.--Self concept pertains to the attitudes the student has about himself, himself in relation to others, and himself in relation to his surroundings. Combs (1962, p. 51) stated: "We mean by the self concept, the ways in which an individual characteristically sees himself. This is the way he 'feels' about himself." In essence it is a measure of the individual in the affective domain of behavior.

Affective Domain.--In defining the educational objectives of the affective domain, Bloom (1956, p. 7) stated that "It includes

objectives which describe changes in interest, attitudes, and values, and the development of appreciations and adequate adjustment."

Academic Achievement.--The term academic achievement refers to a measure of achievement and is equated with a mastery of institutionally prescribed content, with an understanding of or knowledge about a variety of academic subjects. It is essentially a measure of the cognitive domain of behavior.

Cognitive Domain.--In defining the educational objectives of the cognitive domain, Bloom (1956, p. 7) stated that it ". . . includes those objectives which deal with the recall or recognition of knowledge and the development of intellectual abilities and skills."

Attitudes.--Thurstone (1970, p. 128) used the term attitudes to ". . . denote the sum total of a man's inclinations and feelings, prejudice or bias, preconceived notions, ideas, fears, threats, and convictions about any specified topic."

Organization of the Study

The remainder of this investigation is organized in the following manner: Chapter II contains a review of the literature related to self concept and academic achievement. Chapter III presents a description of the research population, instruments, and statistical treatment employed in this study. Chapter IV reports the findings of the study and the results of the statistical analysis. Chapter V is composed of a discussion of the conclusions which can be drawn from the study and their implications for future action.

CHAPTER II

REVIEW OF RELATED LITERATURE

Two major problems surround efforts to strengthen and improve the elementary school curriculum. These are: (1) The lack of knowledge with reference to specific effects of teaching method; and (2) The values attached to one or another outcome of the total educational process. According to Sears (1963), educational outcomes may be generally grouped in three categories: (1) Learning of traditional academic subject matter; (2) Learning of attitudes: toward self and others, toward knowledge, aesthetics; and (3) Learning of skills which facilitate further learning: inquiry, reflective thinking, originality, and flexibility.

Value judgements about the three categories of educational outcomes involve choosing the most important outcome or determining the emphasis to be placed on each outcome. Here, it seems educators are still battling along the progressive-traditional lines. Since there is so little empirically based research of specific effects on children, many educators are inclined to take an either/or position. One group presses for academic excellence, while another fears that lack of attention to social learnings will result in children who are unable to make good adjustments in the personal social areas. It has not been established that the single-minded pursuit of one objective is, in fact, detrimental to the achievement of others.

However, if there should prove to be an appreciable relationship between the development of academic excellence and the development of

self concept in children, then those planning educational programs and strategies should be aware of the extent of this relationship. The related research to be reviewed in this chapter will deal primarily with (1) self concept and achievement at the elementary school level and (2) the educator's perceptions of children at the elementary school level.

Research on Self Concept and Achievement

According to Combs (1963), "Modern psychological theory assigns a crucial role to the child's perception of self and of the world about him as causative agents of behavior." If this position is accurate, then an understanding of the nature of children's perceptions and the relationship of perception to achievement in school is essential knowledge for educational planning and curriculum building.

The experimental approach used by Brookover, Patterson, and Thomas (1965) is derived from the symbolic-interactionist theory of George Herbert Mead (1934). The general hypothesis derived from this theory is that the functional limits of one's ability are in part set by one's self-conception of ability to achieve in academic tasks relative to others. This self concept of ability is acquired in interaction with significant others. Brookover, Patterson, and Thomas (1964, p. 469) stated that "In this context, the self is the intervening variable between the normative patterns of the social group or the role expectations held by significant others, on one hand, and the learning of the individual, on the other."

General studies of the relationship of self concept to achievement of elementary children tend to show a positive, but not always significant, relationship. Brookover, Patterson, and Thomas (1964), in an

extensive study involving 1,050 seventh graders in an urban school system concluded among other things, that (1) There is a significant and positive correlation between self concept and performance in the academic role: this relationship is substantial even when measured IQ is controlled, and (2) There are specific self concepts of ability related to specific areas of academic role performance, which differ from the general self concepts of ability, and in some cases are significantly better predictors of specific subject achievement. Similarly, Coopersmith (1959) using fifth and sixth graders, obtained a partial correlation of .30 between Iowa achievement scores and self-esteem (partialing sociometric status). Bledsoe (1964) using a Self Concept Checklist and the California Achievement Test with 271 fourth and sixth grade children, also found a positive correlation between self concept and academic achievement.

In a study of students in fourth, fifth, and sixth grade, Schwartz (1967) used a variety of observations, ratings, conferences, tests, and test-retests to compare self concept and achievement. She found no observable relationship between the child's self concept and achievement as assessed by standardized tests. However, her study only considered seven underachieving children.

Many approaches have been attempted in order to improve the predictive relationship between self concept and achievement, mainly through the use of different measuring instruments. In a study utilizing projective techniques, LaVerd (1961) studied the self concept of thirteen and fourteen year old students from achievement related statements on the Thematic Apperception Test. He found a significant improvement of the prediction of academic success by including the Thematic Apperception

Test motivation scores in the multiple correlation prediction along with the California Achievement Test and the California Test of Mental Maturity.

One of the early studies using inferential techniques is that of Malpass (1953) who explored the relationship between seventh grade student perceptions of school and academic achievement. Children's perceptions were inferred from their responses on a sentence completion test (a set of pictures depicting various school situations) and a written personal document. Correlating the children's scores on these perception instruments with school success, Malpass found that perceptions of school are not significantly related to the results of standardized achievement tests but seem to be more closely related to achievement as measured by teachers' grades. Therefore, it is possible that the students self concept of ability is developed as a result of the teachers grading and hence becomes a self fulfilling prophecy.

Self concept of ability is sometimes considered a separate or subset of general self concept, in an effort to derive a clearer relationship between self concept and achievement. Such a variable was considered in a study of high school students by Brookover, Erickson, and Joiner (1967). They concluded that the small observed associations commonly found between general self concept and school achievement are primarily the result of the association between academic self concept (known to be highly correlated with achievement) and general self concept. Using a test-retest, Sears (1963) found correlations of approximately .30 between self concept for school subjects and Science Research Associates achievement composite scores in the fall and almost zero in

the spring. These results also seem to indicate that the student as he becomes more familiar with the teachers' grading, adjusts his self concept accordingly.

Underachievers

Since a focal purpose in attempting to determine the relationship between self concept and achievement is to discover ways in which the elementary curriculum can be improved, educators are naturally interested in the underachiever and his self concept. Many studies have been done with the underachiever.

Fink (1962) studied groups of high and low achieving ninth grade students. The students were rated on their degree of adequacy by a psychologist who made ratings from the California Psychological Inventory, Bender Visual Motor Gestalt Test, Draw-A-Person Test, Gough Adjective Check List, a personal data sheet, and a brief essay describing "What I will be in Twenty Years." The results seem to indicate a positive relationship between the child's level of academic achievement and the adequacy of his self concept as inferred by the judges. Cooper-smith (1959) found children with high self concepts but low teacher ratings were better academic achievers than those with low self concepts and high teacher ratings; they were also more self critical and ambitious, while Barrett (1957) empirically demonstrated that underachievers exhibited a predominately negative attitude toward school.

Walsh (1956) made a study of two groups of bright boys from second through fifth grade who were low achievers or satisfactory achievers. She used the Driscoll Play Kit materials to involve the boys individually in situations that might reveal aspects of their self concepts. Self

concepts were then inferred from their verbal responses and the kinds of manipulations they carried out with the dolls in the kit. Lower achievers, she discovered, tended to perceive themselves in ways that restricted their action. They were unable to express feelings appropriately and adequately, felt criticized and rejected or isolated. Fliegler (1957) also suggested that the underachiever may be a mal-adjusted youngster whose inadequate school relationships lead to negative teacher identification. This attitude contributes to the student's inability to achieve in a learning situation and to the setting of lower levels of aspiration.

In a pilot study designed to examine the degree to which self concept is associated with the presence or absence of achievement, Bruck and Bodwin (1962) studied sixty children referred to the Child Guidance clinic during 1960. The children had IQ's ranging from 90 to 110 and ten boys and ten girls were selected from grades three, six, and eleven respectively. Half of the boys and half of the girls in each grade were rated as underachievers. Bruck and Bodwin used the Machover Draw-A-Person Test to measure self concept and defined underachievement as being one year or more retarded in grade level on achievement test scores in one or more subject areas. They obtained a point-biserial correlation of .60, which was significant at the .01 level. This would indicate a positive relationship between educational disability and immature self concept although no cause and effect relationship is claimed.

Disadvantaged

The study of underachievers naturally leads to a consideration of the self concepts of disadvantaged children. What is the relationship

between the self concept and achievement when this variable is considered? In identifying the special educational needs of disadvantaged children, Jacobs and Felix (1966) emphasized the importance of enhancing the self concept of these children, which is seen as the basis for school and academic motivation, which in turn is viewed as a prerequisite to higher school achievement. There is considerable research support for the belief that a more positive self concept not only accompanies successful adjustment and achievement but that the self concept becomes more or less stable over a period of time. Therefore, it is unfortunate that the typical teacher tendency is to identify higher achievement with better work habits, rather than as a result of self concept.

In a study of the disadvantaged Murray (1966) used a modification of a questionnaire developed by Sears, a sociogram, and a teacher rating to determine the self concept and acceptance of disadvantaged children. The sample consisted of four-hundred Negro and white students divided into the following groups: (1) Students from those families receiving financial assistance from public funds. (2) Students from families having an annual income less than \$4,000 but receiving no public funds. (3) Students from families with an annual income of over \$4,000.

Murray concluded that the only significant difference in the measures of self concept was between Negroes in groups one and three, with students in group three generally higher. He also concluded that the white students from public assistance and low income families had significantly less acceptance by their peers than white students from the higher income families. In addition for girls, whites, and the total group the students from public assistance and low income families

had significantly less acceptance by their teachers than from the higher income families

Sex Differences

Several studies have been done which consistently show a difference in the self concepts of girls and boys, and also in relation to achievement. In a study of self concepts and achievement of 271 Georgia fourth and sixth graders, Bledsoe (1967, p. 436) concluded that:

. . . correlations of achievement and self concept for boys were significant and positive; for girls they were non-significant. The mean r (using the Z transformation) for fourth-grade boys between self concept and achievement was .38 for fourth-grade boys and .35 for sixth-grade boys.

Even though the correlations for girls were non-significant, they were in a positive direction. Sears (1963) also reported a generally low, but positive and significant relationship for boys and girls between various aspects of self concept and achievement in the fall. However, when retested in the spring only the boys had any significant relationship. This study was based on 195 students in average (less than 115 IQ) or superior (more than 115 IQ) groups.

In a study of the self concepts of bright, underachieving high school students Shaw, Edison, and Bell (1960) concluded that male underachievers seem to have more negative feeling about themselves than do male achievers while female underachievers tend to be ambivalent with regard to their feeling about themselves. Several explanations regarding the self concept differences among male and female students have been proposed. It has been suggested that differences in self concept of boys and girls at the elementary level may indicate that girls have a higher self concept at this level. It may also be due to the earlier

maturation of girls or the high incidence of women elementary teachers. Still another theory is that boys seem to perceive the abilities measured by achievement tests as more important in their self concept than girls. Also girls may learn more quickly, to report what the teacher wishes to hear.

Age

The theory that girls mature faster, and perceive the teachers' expectations sooner raises the question of the general effect of age on self concept. While there is a male-female differential there is also a general age trend reported in several studies. Morse (1964, p. 198) stated that "The general impression one gets is that for the young child school is a secure, supporting place with regard to his mental health but as he grows older confidence diminishes and school self regard decreases."

In a study based on 600 metropolitan students in alternate grades three through eleven, he determined that 84% of the third graders were proud of their work as compared to 53% of grade eleven, and 93% of the students in the lower grades felt they were doing their best while only 37% of the eleventh graders felt this way. Many studies would seem to be in agreement with the statement made by Morse (1964, p. 198) that "Whatever else we have done, we have communicated a sense of personal failure to many of our pupils. In general, the longer we have them the less favorable things seem to be."

The preceding sections dealing with the relationship of self concept and achievement have considered some of the variables which seem to play a significant but not necessarily causative role in the child's self concept. The list of variables considered thus far is

neither mutually exclusive nor exhaustive, and certainly omits some of the more important variables, namely those related to the idea of significant others. For the student, significant others are those individuals that the student perceives as playing an important or meaningful role in his life. The discussion of significant others which includes, parents, teachers, and counselors will be considered in the next section.

Research on Perception of the Student by Significant Others

The ways in which significant others evaluate the student directly affects the student's conception of his academic ability. This in turn establishes limits on his success in school. This relationship is particularly important at the elementary level, but is vital in all grades.

An experiment reported by Videbeck (1960) supports the proposition that self concepts are learned and that the evaluative reactions of significant others plays an important part in the learning process. This study demonstrates significant changes in self-ratings after one critique by an evaluator. In further support of this position is the evidence which suggests that people significant or important to another person can profoundly influence that person's concept of self. For example, Rosen, Levinger, and Lippitt (1960) investigated the role of group-relevant determinants of desires for change and found a positive relationship between a person's desire for changes and the wishes of others for him.

In their study of seventh grade students in an urban school system, Brookover, Patterson, and Thomas (1964) found that the self concept is significantly and positively correlated with the perceived evaluations that significant others hold of the student. However, it is the

composite image rather than the images of specific others that appear to be most closely correlated with the student's self concept in specific subjects. Russell (1953) reported correlations from a study of fifth and eighth grade children, between self and peer, self and teacher, and self and achievement which ranged from .22 to .65.

A previous investigation by Brookover, Patterson, and Thomas (1962) clearly indicated that self concept of ability functions independent of measured intelligence in predicting school achievement. These results further indicated that a student's self concept of ability is positively related to the image he perceives significant others such as parents, teachers, and peers hold of him. This finding was consistent with the findings in other studies which support the theory that the self concept an individual holds is learned from interaction with other individuals.

Parents' Perception of the Student

In an investigation of the relationship of the self concept of eighth and ninth grade pupils to the ideal held for them by their parents, Helper (1958) found small but positively related correlations between parental evaluations and children's self evaluations.

Several attempts have been made to improve the student's self concept by working through the parents. In one such study Brookover, Patterson, and Thomas (1965, p. 100),

. . . concluded that the self-concept of ability of low achieving students can be enhanced by working with parents and that this improvement in self concept will be reflected in improved academic performance. The positive academic performance, on the other hand, does not maintain itself when such treatment is discontinued. Possibly continued treatment over longer periods will have a more lasting impact.

Teachers' Perception of the Student

One of the most comprehensive studies of the self concept of ability and school success was that of Brookover and his associates (1965, 1967) who conducted a six year study of the relation between self concept of academic ability and school achievement among students in the seventh through twelfth grades. As Brookover, Erickson, and Joiner (1967), p. 110) conclude: "The hypothesis that students' perceptions of the evaluations of their academic ability by others (teachers, parents, and friends) are associated with self concepts of academic ability was confirmed." The almost unavoidable conclusion is that the teacher's attitudes and opinions regarding his students have a significant influence on their success in school. In other words, when the teacher believes that his students can achieve, the students appear to be more successful; when the teacher believes that the students cannot achieve, then it influences their performance negatively.

This self-fulfilling prophecy has been confirmed by research of Rosenthal and Jacobson (1968a; 1968b, p. 121) which they summarized by stating that the evidence suggests that, "children who are expected by their teachers to gain intellectually in fact do show greater intellectual gains after one year than do children of whom such gains are not expected." While their study is based on limited data and frequently criticized, further evidence is provided by Staines (1956), who demonstrated that teachers, through their roles as significant others, can alter the self concept of their students by making positive comments to them as well as creating an atmosphere of greater

psychological security. These findings are related to those of Davidson and Lang (1960) who found that children's perceptions of teachers' feelings toward them correlated positively and significantly with self-perception. They also discovered that the more positive the children's perceptions of their teachers' feelings, the higher their achievement.

In contrast, Schwartz (1967) in a study of seven underachieving children, found no observable relationship between children's achievement and teacher approval. She further concluded that teacher expectations for children's achievement had no apparent relationship to children's achievement on standardized tests.

The obligation of the teacher in developing the child's self concept and consequently his behavior and achievement is summed up by Morse (1964, pp. 195-196) in his statement:

It is soon obvious to the teacher that to understand the meaning of a pupil's behavior the teacher needs to appreciate the particular pattern of a child's self concept. With this knowledge, a teacher has a better chance of dealing appropriately with the moment-by-moment symptomatic behavior in the classroom.

As pointed out by Combs (1963), the values held by the teacher are revealed in the judgements they make about the behavior of the children and there is a low but positive correlation between children's perceptions and their behavior as described by their teacher.

But how effective can a teacher be in changing self concept, behavior, and achievement? Lesser and Abelson (1959) studied the association between self-esteem and persuasibility and concluded that: (1) children with low self-esteem were more persuasible than those with high self-esteem, and (2) persuasibility only occurs when the adult communicator indicates to the child the likely possibility that they

will agree with each other. Sears (1963) also observed in her study, that the groups of below average ability exhibited a greater relationship to teacher and peer judgements, suggesting more persuasibility.

In addition to the direct perceptions a teacher has about a child, an additional variable is the communality of attitudes that the teachers and the children hold in regard to school, classroom activities, and specific subject matter. Sears (1963, p. 12) expressed the teacher's attitudes toward subjects and school as follows:

As well as providing behavioral interaction with children which may modify learning, teachers hold their own attitudes and preferences for certain subject matter and types of activities. If these personal attitudes are harmonious with the attitudes of certain children, it would be expected that the educational process would for them proceed more smoothly; if teacher and children are widely separated, disharmony seems likely.

In essence, the teacher serves as a role model to the children, from which the children learn or model their own attitudes. The degree of similarity in attitudes is an important variable with reference to the classroom conditions influencing learning.

Counselors' Perception of the Student

Many schools have made serious and extensive attempts to alter or enhance the students' self concepts in order to improve their behavior and increase their achievement. Many such experiments have centered around the counselor, or the concept of counseling. In essence the counselor has been looked upon as the major resource person, although such efforts have also involved or recognized the role or effect of teachers, parents, peers, etc. As an educator, the counselor should understand the relationship between self concept, behavior, and achievement and make every effort to utilize that knowledge to enhance the student's self concept.

One such experiment was conducted by Hamcheck (1968) and was designed to change negative self concept and thus achievement through counseling. In that experiment students with low achievement and with low self concept were randomly assigned, fifty each, to an experimental or a control group. With the experimental group the counselors conducted group and individual sessions to establish the counselor as a supportative significant other. Self concept was measured by the Mooney Problem Checklist, the SRA Youth Inventory, California Psychological Inventory, and the Maslow Security-Insecurity Inventory on a pre and post test basis. When the experimental and control group were compared at the end of the year the following were noted: (1) The experimental group self concept went down during the year. (2) There were no significant differences in GPA of the two groups. (3) The attitudes toward grades went down in both groups, but significantly so in the experimental group. (4) Both groups felt the parents perception of them was lower at the end of the year. (5) A significant difference in that the control group felt teachers had a more positive image of them.

Several explanations have been given for the results of the Hamcheck experiment. Possibly one year is not sufficient for lasting change or the students may have maintained their problem status in order to continue regular contact with the friendly counselor. It would seem from this experiment that the school actually reinforced the students poor self concept. The students also seem to look upon the counselor differently than the teacher, possibly more as an outsider. Hamcheck (1968, p. 13) concluded, " . . . that there are some apparent risks in an outsider moving too directly into a student's life-space. Perhaps

the people already in a youngster's life have the most strategic advantage and we should work aggressively through them."

Brookover, Patterson, and Thomas (1965) attempted to enhance the self concept of ability of low-achieving Junior High students through: (1) modification of images held by the parent, (2) direct contact with an expert, and (3) interaction with a counselor. A significant increase in both self concept of ability and GPA were obtained through parents, but the expert and the counselor failed to induce significant increases in either GPA or self concept. The students working with the counselor showed a trend toward lower self concepts, grades became even less important, their GPA went down, the students believed that the teachers' perceptions had gone down, but they did feel more secure. The experimenters also concluded that an expert presenting material designed to enhance self concept of ability in a formal manner is not an efficient strategy for increasing either self concept of ability or school performance among low-achieving ninth grade students.

In an experimental counseling program in Olympia Washington, during 1966-67 Usitalo (1967) attempted to improve teacher attitudes, the elementary child's self concept, and the teacher-pupil relationship. This was attempted through changes in classroom environment, curriculum, teacher-pupil relationships, and more emphasis on the affective and psychomotor domains. As a result of the program a slightly positive but not significant change in teacher attitude towards the students was observed. However, no significant change due to counselor intervention was recognized by the teacher. Several possibilities may account for these findings, the most likely of which is that the teacher's attitudes like the child's, if they change, come about over a longer period of time.

In conclusion, considerable evidence has been found for accepting the hypotheses that self concept of academic ability derive primarily from perceived evaluations of significant others; and that for most students, self concept of ability is a functionally limiting factor in their academic achievement. In addition, the findings warrant the view that self concept intervenes between the perceived evaluations of others and performance.

Educators should recognize that, "For the younger child, however, ideal self-images incorporated within the child become destructive when the child sees some glimpse of what he should be, sees himself as he is, and feels he is less than he should be" (Usitalo, 1967, p. 57). Educators must play a vital role in helping the child live with that incongruency.

Summary

The results of many studies of elementary children have demonstrated that there is an observable relationship between general self concept and achievement (Brookover, Patterson, & Thomas, 1964; Coopersmith, 1959; Schwartz, 1967) and the more specific self concept of ability and achievement (Malpass, 1953; Sears, 1963). These previous studies have normally taken place in an existing environment, rather than attempting to manipulate the environment in any way. Since this relationship exists and is generally positive, although not always significant, many researchers have deemed it appropriate to study the self concept of underachievers (Fink, 1962; Coopersmith, 1959; Barrett, 1957; Walsh, 1956; Fliegler, 1957) in an attempt to find ways to help those students improve their level of achievement.

Other variables which seem to be closely related to self concept and achievement includes sex differences (Bledsoe, 1967; Sears, 1963; Shaw, Edison, & Bell, 1960), disadvantaged (Jacobs & Felix, 1966; Murray, 1966), and the length of time spent in the school environment (Morse, 1964).

Sufficient studies already exist to support the interactionist theories of significant others (Videbeck, 1960; Rosen, Levinger, & Lippitt, 1960; Russell, 1953; Brookover and associates, 1962, 1965, 1967) determining or forming the child's self concept. One of the most prominent significant other in the school environment is the educator (Rosenthal & Jacobson, 1968a; Staines, 1956; Davidson & Lang, 1960). Consequently many schools have made extensive efforts to alter or enhance student self concept by working through the educators such as teachers (Morse, 1964; Lesser & Abelson, 1959; Sears, 1963) and counselors (Hamcheck, 1968; Brookover, Patterson, & Thomas, 1965; Usitalo, 1967).

While the relationship between self concept and achievement seems quite clear, efforts to improve self concept have been relatively short-term and unsuccessful. It may be that enough is still not known about the cause and effect relationship of the many variables involved or that changes in the self concept occur slowly in either children or adults. Consequently, it takes a great deal of time to change the adult's self concept or perceptions of others, in order to effect changes in the child's self concept.

CHAPTER III

DESIGN AND PROCEDURES

Research Population

The research population was selected from students attending and staff employed by two elementary schools in Grand Forks, North Dakota during the 1971-72 school year. These schools were chosen to participate in a pilot project designed to enhance self concept and attitudes of students and staff. At the time of this study the project was in its second year of operation and was funded during 1971-72 by the United States Office of Education under the Elementary and Secondary Education Act, Title III, P.L. 89-10, as amended. The name of this project was Human Awareness Through Self Enhancing Education (HATSEE).

The project objectives for the 1971-72 school year were as follows:

1. The trainees (staff members who participated in a 30 hour workshop with Norma Randolph) will increase their understanding of self-insight and/or personal change, as measured by the Self Enhancing Education Trainee Scale.
2. The trainees will increase their skills in understanding other's feelings and ideas and in dealing with interpersonal conflict and misunderstanding as measured by the Self Enhancing Education Trainee Scale.

3. The staff of Eielson and Twining Schools will learn the self enhancing education philosophy and technique for nurturing self enhancement in students as measured by the Self Enhancing Education In-service Reaction Scale.
4. The staff will implement communicative techniques and processes as measured by the Self Enhancing Education Implementation Inventory.
5. The learner (student) will demonstrate changes in self concept, motivation, aggression, and learning as measured by pre and post administration of the AML Behavior Rating Scale.
6. The classroom teachers will demonstrate their competencies of conditioning the learner for developing self concept as measured by interaction analysis.
7. The classroom teacher will, through pre and post assessment, demonstrate an improvement in skill attainment for diagnosing and removing pupil learning and developmental disabilities.
8. The learner will demonstrate improved success as measured by accepted scales of attainment.
9. The learner will demonstrate improved self concept as revealed by measurable data from attitude inventories through group and individual assessment.

These are the behavioral objectives which were stated on the proposed Title III application. These behavioral objectives have been changed; this is not to say the general goals have in any way been changed; rather, the changes have been made by the project evaluator to better

measure various aspects of the HATSEE program. It was felt that the instruments actually used yielded significantly more useful information than those instruments that were originally proposed. Additionally, the use of a much larger battery of tests allowed the scope of the overall evaluation to be considerably broadened. The newly stated behavioral objectives are:

1. Educators receiving formal SEE training (Randolph-30 hours) will develop an increased appreciation of the relationship between their feelings and behavior as measured by the Index of Adjustment and Values (Original objective 1).
2. Educators receiving formal SEE training will further develop their appreciation of others' feelings and ideas as measured by the Philosophy of Human Nature and the Ideal Child Checklist (Original objective 2).
3. The staff will implement communicative techniques and processes as measured by the Self Enhancing Education Implementation Inventory (Original objective 4).
4. Educators' ability to implement the self-enhancing philosophy will be reflected in these four ways:
 - a. Increased student self-concept as measured by the What Would You Do? and The Class Play (Original objectives 6 and 9).
 - b. Increased student appreciation of the several dimensions of school as measured by the School Sentiment Index (Original objective 3).

- c. The several dimensions of the Self Appraisal Inventory (Original objective 5).
- d. Increased student learning as measured by the Iowa Test of Basic Skills (Original objectives 7 and 8).

The two schools involved in the project were the Carl Ben Eielson and Nathan Twining Elementary Schools. These schools were located adjacent to the Grand Forks Air Base and serving the children of those military personnel living on or near the Air Base. As of the beginning of school in September, 1971, enrollment and staffing populations were as follows:

1. Twining Elementary - 1209 students in K through eight.
2. Eielson Elementary - 822 students in K through eight.
3. Twining Elementary - 52 professional educators (administrators, teachers, and teacher aides)
4. Eielson Elementary - 45 professional educators (administrators, teachers, and teacher aides)

The research population for the HATSEE evaluation was chosen by the project officials, and included all members of the professional staff. Students in grades three through eight were selected in the following manner:

1. Twining Elementary - all students in grades three, five, seven, and eight.
2. Eielson Elementary - all students in grades four, six, seven and eight.

Staff and students in the research population were tested initially in the fall and retested, using the same instruments, near the close of the school year (in April). The tests were administered by the project officials, except for the ITBS which was administered by the classroom teachers. The data analysis in this study included those

staff members (N=83) and those students in grades three (N=119), four (N=73), five (N=103), six (N=58), seven (N=95), and eight (N=80) who were employed by or attended their respective school for the entire year and completed all the initial tests and retests.

Sources of Data

The sources of the data used in this study were the following:

1. Students selected by the project officials for initial testing and retesting during the 1971-72 school year.
2. Administration of the Self Appraisal Inventory to the selected students early in the fall and late in the spring of the 1971-72 school year.
3. Administration of the School Sentiment Index to the selected students early in the fall and late in the spring of the 1971-72 school year.
4. Administration of the Class Play or the What Would You Do? to the selected students early in the fall and late in the spring of the 1971-72 school year.
5. Administration of the Iowa Test of Basic Skills to the selected students early in the fall and late in the spring of the 1971-72 school year. All students were given the ITBS in the fall.
6. All the professional educators employed during the 1971-72 school year.
7. Administration of the Ideal Child Checklist to the professional educators early in the fall and late in the spring of the 1971-72 school year.

Instruments

The instruments used in this study were the Self Appraisal Inventory (SAI), the School Sentiment Index (SSI), the Class Play (CP), the What Would You Do? (WWYD), the Iowa Test of Basic Skills (ITBS), and the Ideal Child Checklist (ICC). The above instruments represent only a portion of the instruments used in the overall evaluation of the Human Awareness Through Self Enhancing Education (HATSEE) project.

Four of the instruments used in this study were developed by the Instructional Objectives Exchange (1970a, 1970b). The Instructional Objectives Exchange (IOX) was established in 1968 by the University of California, Los Angeles Center for the Study of Evaluation to:

1. Serve as a clearinghouse through which the nation's schools could exchange instructional objectives.
2. Collect and develop measuring techniques suitable for assessing the attainment of the objectives available through the Exchange.
3. Develop properly formulated instructional objectives in important areas where none currently exist.

Development of the IOX instruments, used in the evaluation of the HATSEE project, was supported by the combined efforts of a number of state Title III programs (ESEA, 1965). The Title III officials of these state programs, recognizing the lack of affective objectives and measures which might be used in connection with educational needs assessment and evaluation enterprises in their states, cooperated to support development of objectives and measuring devices by the IOX (1970a, 1970b).

In January, 1970, representatives of Title III programs in approximately forty states gathered for a meeting in Washington, D. C. to discuss the availability of objectives and measuring devices which might be used for their educational needs assessments and evaluations, particularly in the affective domain. Representatives of the IOX (1970a, 1970b) joined with those educators on that occasion to indicate that after approximately eighteen months of nationwide searching, only a few affective objectives and measures had been located by the Exchange. It became apparent that if rapid progress toward development of affective objectives and measures was to be made, some individual or agency would systematically have to undertake the development work.

The Title III representatives decided to pool certain of their financial resources and cooperatively support a development project by the IOX (1970a, 1970b). The assignment was to produce objectives and measures which might be employed for educational needs assessment and education evaluation in specific affective areas. After considerable discussion regarding the affective dimensions most in need of assessment, two high priority affective areas were identified, namely, the learner's (1) self concept and (2) attitude toward school. IOX was commissioned to develop a number of objectives in these two fields and to make these available, not only to the Title III projects, but to other educators in need of such measures.

Because development efforts were to focus on the preparation of objectives and measures which could be used to assess the quality of an educational program, e.g., a program intended to improve learners' self concepts and attitudes toward school, the IOX (1970a, 1970b) had one significant advantage over predecessors who had

developed similar or related measures. It did not have to defend the validity of a given self concept or attitudinal measure for an individual child. The major focus was in the area of developing measures to be used for group assessment purposes. Therefore, some aberrance in the individuals' responses to the measures could be tolerated, since for the most part the devices would be employed with groups.

The approach used by the IOX (1970a, 1970b) to develop objectives and measures was predominately a criterion-reference measurement approach, in which an objective was formulated, as clearly as possible, and then measures were devised to assess the attainment of the objective. The emphasis was on the congruence between a measurable stated objective and the measuring devices based on that objective. It should be noted that no normative data of the classical norm-referenced type was yet available with these recently devised measures. However, efforts were made during the course of this study to establish measures of reliability and stability for these instruments. The findings are reported in the evaluation for the Grand Forks School District (Williams et al., 1972).

The Self Appraisal Inventory by the Instructional Objectives Exchange (1970a) is a direct self report test designed to measure positive self concept. It is available in three levels: primary, intermediate, and secondary. In this study the primary level was used with students in grades three, four, and five of the research population. The intermediate level was used with students in grades six, seven, and eight of the research population.

The primary level SAI is a forty item test requiring yes-no responses to a series of questions dealing with self concept along four dimensions or subscales: (1) general, (2) family, (3) peer,

(4) scholastic. The intermediate level SAI is an eighty item test requiring true-untrue responses to statements dealing with the same four dimensions or subscales. These self report devices attempt to secure, in a rather straightforward fashion, a child's responses to questions or statements which pertain to the four dimensions. Three of these four dimensions (family, peer, scholastic) are viewed as areas in which one's self concept has been or is being formed. The fourth dimension reflects a more general, global estimate of self esteem. A composite score will provide a global estimate of self concept.

The School Sentiment Index by the Instructional Objectives Exchange (1970b) is a direct self report test designed to measure attitudes toward school in general and toward several dimensions of school. Primary, intermediate, and secondary level forms were available and the primary and intermediate tests were used with the same grades as the SAI.

The primary level SSI is a thirty item test requiring yes-no responses to a series of questions dealing with attitudes along five dimensions or subscales: (1) teacher, (2) school subjects, (3) school social structure and climate, (4) peer, (5) general. The intermediate level SSI is a seventy-five item test requiring true-untrue responses to a series of statements which pertain to the above five aspects of attitude toward school. On each level, a composite score will provide a global estimate of attitude toward school.

The Class Play by the Instructional Objectives Exchange (1970a) is an inferential self report in which the students will display self concepts. This instrument asks the student to pretend that children are to be selected for a play. The respondent is asked to select the roles for which his teacher and members of his family would choose him.

The number of "yes" responses to favorable roles indicates the total score for the respondent. The assumption is that an individual who has a positive self concept will perceive that others would be likely to cast him in roles which carry a positive image. This instrument contains twenty questions at the primary level and was administered to students in grades three, four, and five of the research population.

The What Would You Do? by the Instructional Objectives Exchange (1970a) is an inferential self report in which students display positive self concepts by their responses to a series of hypothetical questions and alternative actions. Certain of the actions are consistent with behavior of one who has a positive self concept, while others are associated with behavior of someone who has a negative self concept. This twenty item inventory presents a series of fictitious situations, each followed by four actions or interpretations. The person completing the inventory is asked to choose one of the four alternatives that is most like what he would think or do. Two of the four choices are designed to reflect the behavior or thoughts of one who possesses a positive self concept, two choices to reflect a negative self concept. The number of positive alternatives selected by an individual constitutes his score. The situations posed in the instrument were drawn from the literature regarding self concept, principally the writings of Coopersmith and Wylie, and deal with the following situations: (1) the need to accommodate, (2) expectations of acceptance, (3) courage to express opinions, (4) willingness to participate, (5) expectation of success. This inventory was administered to grades six, seven, and eight of the research population.

The Iowa Test of Basic Skills is a nationally recognized and standardized instrument for testing the academic achievement of elementary children. The test battery consists of eleven separate tests for grades three through nine. These tests were devised to test functional skills of children in the areas of vocabulary, reading comprehension, language skills, work-study skills, and arithmetic.

The entire battery of tests requires about five hours to administer, four hours and thirty-nine minutes of which is actual working time. It is recommended that the tests be given on four consecutive days. Under no circumstances should they be given in a single day. The standard procedures were followed in administering the tests.

Herrick in reviewing the ITBS in Buros' Mental Measurements Yearbook (1959) felt that because of the length of the test, one would expect the reliability coefficients to be high and they are. They range from .84 to .96 for the major tests and from .70 to .93 for the subtests. Intercorrelations among the various subtests range from .37 to .83. Vocabulary and reading have the highest intercorrelations with all other subtests indicating a heavy loading of all subtests with vocabulary and reading skills.

Remers in reviewing the ITBS in Buros' Mental Measurements Yearbook (1959) felt that the correlations were sufficiently high for individual diagnosis and prediction. The within-grade split-half reliability coefficients for the total test battery scores, each based on 500 cases, are reported as .97 for grade three and .98 for all other grades. The ITBS norms were established using populations of eleven to thirteen thousand students per grade. The normative

population was intended to constitute a stratified random sample of communities in eight geographical regions. The only large deviations from census data are shortages of rural children in the east north central region and of children from south central urban communities of 100,000 and over. This latter omission may have depressed the norms a bit, since a city of this size would be more likely to have a higher quality educational program than the surrounding rural area.

The ITBS may be machine or manually scored with the scores reported as grade equivalents or within grade percentile ranks. The tests for this evaluation were machine scored and both the within grade percentiles and the grade equivalents were reported to the schools. However, the grade equivalents were used for the statistical analysis in this study.

The Ideal Child Checklist by E. Paul Torrance (1970) is a checklist of child behavior characteristics which are encouraged or discouraged by teachers and parents. It is Torrance's (1967) opinion that the most powerful way in which a culture influences creative development of the child is the way in which teachers and parents encourage or discourage, reward or punish those characteristics necessary for creative functioning. This encouraging and discouraging process is generally reflected in what parents and teachers regard as ideal behavior or the kind of person they would like the child to become.

In developing this instrument Torrance (1965, 1967) used more than fifty empirical studies which identify highly creative and less creative individuals. In all of these studies, individuals identified as being highly creative on some criterion or creative behavior were

contrasted with comparable individuals on personality measures derived from traditional tests such as the Thematic Apperception Test, the Minnesota Multiphasic Personality Inventory, the Rorschach Ink Blots, and others. The first checklist derived from these studies consisted of eighty-four characteristics. The list was reduced to sixty characteristics and then "healthy" and "physically strong" were added for reference purposes. This basic checklist is included in both the Ideal Pupil Checklist and the Ideal Child Checklist and the instructions are essentially the same.

According to Torrance (1967, p. 35) the general instructions for rating the characteristics on the checklist are:

Check each of the characteristics listed on this page which would describe the kind of person you would like to see the children you teach become. Doublecheck the five characteristics which you consider most important and believe should be especially encouraged. Draw a line through the characteristics which you consider undesirable and which should be discouraged or punished.

For any sample or subject, rankings can be obtained by weighting the responses of the subjects in the following manner:

1. Two points for each doublecheck (especially encourage)
2. One point for each single check (encourage)
3. Zero points for each unmarked response (neither encourage or discourage)
4. Minus one point for each line drawn through a response (discourage)

Latter forms of the checklist, such as the one used in this study, permit an unlimited number of doublechecks. A Q-sort method can also be used with the latter forms, but the preceding method has the advantage of being easy to administer in a short period of time to either an individual or a group.

In order to obtain at least a tentative standard against which sets of group ratings could be compared Torrance (1965) compiled an "Expert Creative Personality Q-Sort." The statements in the Ideal Pupil Checklist were transformed into a Q-sort and rated by a panel of ten judges. All of the judges had had advanced graduate courses in personality theory and all of them had been serious students of the creative personality for at least one year. The ratings of the ten experts were combined and converted into a composite Q-sort by adding the ratings received by each item, ranking the items on the basis of these values and then placing them into the original Q-sort distribution.

The checklist has subsequently been administered to teachers and parents in the United States and in several other countries. Several comparisons have been made among these groups and also with the original panel of judges. Torrance (1963, p. 221) reported that:

We have results from 650 teachers in ten different states (Minnesota, Wisconsin, Illinois, Michigan, California, Georgia, Florida, Mississippi, Nebraska, and Hawaii) and six countries outside the United States (Canada, Australia, Germany, Western Samoa, India, and the Philippines). The rank-order coefficients of correlation among the various localities within the United States is very high (around .95). This means that teachers in Minnesota have essentially the same concepts of the ideal pupil as their colleagues in Wisconsin, California, Georgia, and Mississippi.

Torrance (1965) reported rank-order correlation coefficients with the original panel of .51 for 264 New York area teachers, .42 for 583 United States teachers, and .42 for 257 Minneapolis-St. Paul parents. He also reported correlations between .30 and .47 for teachers in the Philippines, Greece, India, and Germany when compared with the original panel of judges. The United States sample of 583 teachers from

Wisconsin, Minnesota, Illinois, Michigan, California, Georgia, Florida, Nebraska, and Mississippi correlated .95 with the New York area sample and the subsamples correlated .93 or higher.

In a cooperative research project for the United States office of education, Torrance (1967) reported rank-order coefficients or correlation between the rankings of a comparison group of teachers and a larger group of United States teachers. The comparison group was from a suburb of Minneapolis and correlated .96 with the 1,512 United States teachers. Similar relationships were also found between the comparison group of teachers and teachers in specified areas of the United States. For example, a rank-order coefficient of correlation of .94 was obtained when compared with a sample of teachers in Sacramento, California and .98 when compared with a sample of teachers in Georgia. Raina and Raina (1971) reported a rank-order coefficient of correlation between 100 teacher-educators in India and 1,512 United States teachers, of .76.

The above findings suggest that there is a great deal of commonality between the values of teacher groups throughout the United States and a moderate amount with teachers in other countries. Torrance and others have used the checklist to make cross cultural comparisons of the pupil or child behavior characteristics desired by parents and teachers. As an outcome of these comparisons, he suggests that teachers examine critically their values and ask if the way they encourage and discourage various personality characteristics is in harmony with the development of the child's potentiality.

Statistical Treatment

The first four research questions stated in Chapter I deal with self concept and/or academic achievement of the students. However,

different forms of the instruments, for measuring self concept, were used at the primary (grades three, four, and five) and the intermediate (grades six, seven, and eight) levels. Consequently, in the statistical treatment of these four questions, the variables were treated independently at the primary and intermediate levels.

To analyze research questions one and two, related t tests were performed between the means of the variables on the initial tests and the means of the variables on the retests. Since grade equivalents were used to measure the results of academic achievement, the data for each grade was analyzed and interpreted independently. For research question two adjusted t values were calculated which would compensate for the expected growth of .6 grade equivalents, in academic achievement, during the elapsed period of six months between the initial testing and retesting. In addition to t values (or adjusted t values) means and standard deviations were reported for both the initial testing and retesting.

Research questions three and four were treated statistically through the use of canonical and zero order correlations. Canonical correlation is a statistical technique used to determine the interrelationship between two sets of variables; in this case, between ten self concept variables and five achievement variables. According to Cooley and Lohnes (1971) and Tatsuoka (1971) a canonical correlation is the maximum correlation between linear functions of the two vector variables. After that pair of linear functions that maximally correlates have been located, there may be additional pairs of functions and maximally correlate, subject to the restriction that the functions in each new pair must be uncorrelated with all previously located functions. That is, each pair of functions is so determine as to maximize

the canonical correlation (R_c) between functions, subject to the restriction that they be entirely orthogonal to all previously derived linear combinations. Besides the canonical correlation coefficient (R_c), interest centers on the interpretation of the canonical factors and the weights associated with each of the variables.

The canonical correlation model appears to be a complicated way of expressing the relationship between two measurement batteries. However, it is actually the simplest analytic model, despite the difficulty in interpretation, that can begin to generalize the simultaneous interrelationship between two sets of variables. Cooley and Lohnes (1971, p. 176) point out that:

A useful supplement to, but no substitute for, the canonical structure is provided by the multiple correlation analysis of each variable of each set regressed on all the variables of the other set.

The final question in Chapter I deals with the teachers perception of the child and utilizes an instrument which ranks child behavior characteristics. The ranking of these characteristics is determined by the mean score for each characteristic, which is calculated by using the weighted scores for each subject on that particular characteristic. The mean scores were used to determine the ranking of the characteristics on the initial test and on the retest. A related t test was then performed between the means of the characteristics on the initial tests and the retests to determine if any significant differences exist in the initial test and retest rankings of the characteristics. Means and standard deviations are also reported for both the initial testing and retesting.

CHAPTER IV

ANALYSIS OF THE DATA

The findings are presented in the order of the research questions presented in Chapter I. The research questions are stated in null form to facilitate analysis of the data. The related t test was employed for comparison of the initial testing and retesting data on students and teachers. Canonical correlations and Pearson product-moment correlations were used to analyze the relationships between self concept and academic achievement. Since grade equivalents were used to report the results of academic achievement, as measured by the Iowa Test of Basic Skills, the data for each grade was analyzed and interpreted independently.

Analysis of Relationships Between Initial Testing and Retesting of Self Concept

Each of the grades were analyzed independently to determine relationships between the initial testing and retesting of students on self concept, as measured by the Instructional Objectives Exchange (IOX) battery. The IOX battery consisted of four scales and a composite score on the Self Appraisal Inventory (SAI), five scales and a composite score on the School Sentiment Index (SSI), and either the Class Play or What Would You Do?

Null Hypothesis 1

There is no significant difference in initial testing and retesting of self concept among students in the participating schools.

To analyze the research question, related t tests were performed between the means of the variables on the initial testing and the means of the variables on the retesting. For each grade, means and standard deviations are reported for the initial testing (pretest) and retesting (posttest). The findings of these relationships for grade 3 are presented in Table 1. A t value of 1.981 was necessary for significance at the .05 level and 2.620 for significance at the .01 level. The

TABLE 1

MEANS, STANDARD DEVIATIONS, AND t VALUES ON GRADE 3 IOX TESTS (N=119)

Variable	Pretest		Posttest		t
	Mean	S.D.	Mean	S.D.	
SAI Peer	7.487	2.487	6.773	2.676	-2.781**
Family	3.538	1.274	3.034	1.327	-4.409**
School	7.303	2.392	6.336	2.488	-3.928**
General	6.891	1.736	6.328	1.909	-2.847**
Composite	25.202	5.975	22.429	5.917	-5.149**
SSI Teacher	4.109	1.261	4.126	1.516	.121
Subject	4.739	1.470	4.571	1.565	-1.095
Structure	3.143	1.284	2.966	1.321	-1.251
Peer	3.412	1.189	3.008	1.232	-3.031**
General	3.706	1.787	3.429	1.749	-1.837
Composite	19.092	4.847	18.134	5.366	-2.144*
Class Play	7.420	2.272	6.950	2.537	12.152*

*Significant at the .05 level

**Significant at the .01 level

differences between means was negative and significant at the .01 level for all the scales of the SAI, and the peer scale on the SSI. The difference was negative and significant at the .05 level for the Class Play and the composite on the SSI. The negative values indicate lower means on the retest. This would seem to indicate that the third grade students generally had a lower or less positive self concept at the end of the school year. The null hypothesis was rejected for all SAI variables, SSI variables peer and composite, and the Class Play.

The findings for grade 4 are reported in Table 2. A t value of 1.993 was necessary for significant at the .05 level and 2.645 at the

TABLE 2
MEANS, STANDARD DEVIATIONS, AND t VALUES ON GRADE 4 IOX TESTS (N=73)

Variable	Pretest		Posttest		t
	Mean	S.D.	Mean	S.D.	
SAI Peer	8.151	2.126	7.726	2.605	-1.372
Family	3.110	1.496	3.164	1.333	.270
School	7.247	2.493	6.452	2.577	-2.409*
General	6.849	1.401	6.685	1.615	-.893
Composite	25.315	5.490	24.027	6.130	-1.785
SSI Teacher	4.315	1.223	3.959	1.136	-1.910
Subject	5.055	2.999	4.452	1.573	-1.584
Structure	3.562	1.202	3.466	1.191	-.539
Peer	3.137	1.045	3.192	1.151	.320
General	3.466	1.944	3.329	1.795	-.573
Composite	19.233	4.335	18.397	4.418	-1.433
Class Play	6.644	2.281	6.384	2.580	.689

*Significant at the .05 level

**Significant at the .01 level

.01 level. The differences, although mostly negative, were nonsignificant except for the school scale on the SAI. This would seem to indicate little or no change in students' self concept during the fourth grade. The null hypothesis was rejected for the school variable on the SAI.

The findings for grade 5 are presented in Table 3. A t value of 1.983 was necessary for significance at the .05 level and 2.624 at

TABLE 3
MEANS, STANDARD DEVIATIONS, AND t VALUES ON GRADE 5 IOX TESTS (N=103)

Variable	Pretest		Posttest		t
	Mean	S.D.	Mean	S.D.	
SAI Peer	7.903	2.307	6.408	1.871	-7.498**
Family	3.388	1.352	3.767	1.789	2.149*
School	6.718	2.341	6.951	2.130	1.085
General	6.981	1.578	6.660	1.425	-1.684
Composite	24.971	5.593	23.612	5.244	-2.656**
SSI Teacher	4.485	1.290	4.583	1.225	.579
Subject	4.524	1.650	4.019	1.590	-3.162**
Structure	3.660	1.209	3.689	1.163	.224
Peer	3.816	.978	3.650	1.218	-1.161
General	3.437	1.725	3.340	1.689	-.536
Composite	19.971	4.469	19.272	4.763	-1.384
Class Play	6.728	2.101	6.243	2.337	-2.434*

*Significant at the .05 level

**Significant at the .01 level

the .01 level. The peer and composite scales of the SAI and the subject scale of the SSI were negative and significant at the .01 level. The Class Play was negative and significant at the .05 level while the family scale on the SAI was positive and significant at the .05 level. It appears that during the course of the year the self concept of fifth grade students as related to themselves, their peers, and their school subjects declined, but their self concept in relation to their family improved. The null hypothesis was rejected for the peer, family, and composite variables on the SAI, subject variable on the SSI, and the Class Play.

It might also be noted that there seems to be a general trend for the older students to show more improvement during the year than the younger students on the primary version of the IOX battery which was administered to students in grades three, four, and five.

The IOX battery for grades six, seven, and eight utilized the intermediate versions of the SAI and SSI. What Would You Do? was used in place of the Class Play. The data for grades six, seven, and eight was analyzed independently in the same manner as grades three, four, and five. The findings for grade 6 are reported in Table 4. A t value of 2.002 was necessary for significance at the .05 level and 2.663 at the .01 level. The differences, although mostly negative, were nonsignificant except for the learning scale on the SSI. This would indicate little or no change in student self concept during the sixth grade. The null hypothesis was rejected for the subject variable on the SSI.

TABLE 4

MEANS, STANDARD DEVIATIONS, AND *t* VALUES ON GRADE 6 IOX TESTS (N=58)

Variable	Pretest		Posttest		<i>t</i>
	Mean	S.D.	Mean	S.D.	
SAI Peer	12.897	3.946	12.207	4.175	-1.579
Family	15.086	3.125	14.138	3.855	-1.922
School	13.569	3.867	12.759	3.677	-1.535
General	13.724	3.254	12.966	3.433	-1.623
Composite	55.276	11.298	52.414	12.475	-1.923
SSI Teacher	23.621	6.973	21.983	7.323	-1.640
Learning	3.397	1.242	2.948	1.234	-2.548*
Structure	9.931	3.303	10.207	2.777	.737
Peer	6.810	2.123	6.741	2.149	-.262
General	5.931	2.231	5.931	2.110	.000
Composite	49.724	13.345	48.172	12.768	-1.003
What Would You Do?	15.483	10.870	14.483	2.422	-.702

*Significant at the .05 level

**Significant at the .01 level

The findings for grade 7 are presented in Table 5. A *t* value of 1.986 was necessary for significance at the .05 level and 2.629 at the .01 level. The structure scale on the SSI was negative and significant at the .05 level. The rest of the IOX battery was nonsignificant and mostly negative, indicating very little change in self concept during the seventh grade. The null hypothesis was rejected for the structure variable on the SSI.

TABLE 5

MEANS, STANDARD DEVIATIONS, AND *t* VALUES ON GRADE 7 IOX TESTS (N=95)

Variable	Pretest		Posttest		<i>t</i>
	Mean	S.D.	Mean	S.D.	
SAI Peer	12.442	3.999	12.547	4.071	.266
Family	14.484	4.230	14.021	4.263	-1.408
School	12.968	4.140	12.263	4.293	-1.748
General	13.095	3.682	13.474	3.423	1.122
Composite	52.989	13.103	52.305	12.746	-- .632
SSI Teacher	20.937	7.217	20.589	6.706	- .463
Learning	3.011	1.242	2.747	1.421	-1.765
Structure	9.326	2.930	8.684	2.565	-2.198*
Peer	6.874	1.841	6.558	1.966	-1.502
General	5.663	2.191	5.316	2.270	-1.659
Composite	45.916	12.571	43.695	11.270	-1.847
What Would You Do?	13.863	2.879	13.558	3.080	-1.057

*Significant at the .05 level

**Significant at the .01 level

The findings for grade 8 are reported in Table 6. A *t* value of 1.990 was necessary for significance at the .05 level and 2.638 at the .01 level. At the eighth grade level the structure scale on the SSI was positive and significant at the .01 level which would seem to indicate a positive change in attitude towards the school's organizational structure. The null hypothesis was rejected for the structure variable on the SSI.

TABLE 6

MEANS, STANDARD DEVIATIONS, AND *t* VALUES ON GRADE 8 IOX TESTS (N=80)

Variable	Pretest		Posttest		<i>t</i>
	Mean	S.D.	Mean	S.D.	
SAI Peer	13.087	4.285	12.912	4.948	-.449
Family	14.787	3.389	14.375	4.244	-1.096
School	12.337	4.497	12.550	4.802	.476
General	13.612	3.046	12.938	3.820	-1.893
Composite	53.825	11.195	52.762	14.443	-.899
SSI Teacher	21.188	6.444	21.862	6.673	.986
Learning	2.737	1.473	2.650	1.303	-.650
Structure	8.737	2.642	9.563	2.950	2.900**
Peer	7.300	1.626	7.412	1.770	.494
General	5.337	2.140	5.362	2.235	.114
Composite	45.262	10.536	46.887	12.143	1.516
What Would You Do?	13.688	3.055	13.825	2.929	.440

*Significant at the .05 level

**Significant at the .01 level

A similar trend on the intermediate battery as on the primary battery appears. The older students tend to show more improvement or more positive improvement in self concept during the school year, than younger students taking the same test battery.

For third, fourth, and fifth grade students taking the primary version of the IOX battery significant results were obtained more frequently on the SAI variables and the Class Play. By contrast,

significant results for students in grades six, seven, and eight were obtained on the learning or structure variable of the SSI. This would seem to indicate that third, fourth, and fifth grade students are more concerned with what others, such as peers, parents, and teachers, think of them. The sixth, seventh, and eighth graders seem more concerned with attitudes toward school, specifically the learning and structure aspects.

Analysis of Relationships Between Initial Testing and Retesting of Academic Achievement

Each of the grades were analyzed independently to determine relationships between the initial testing and retesting of students on academic achievement, as measured by the Iowa Test of Basic Skills (ITBS) battery. The ITBS battery consisted of tests in vocabulary, reading, language, work study skills, arithmetic, and a composite score.

Null Hypothesis 2

There is no significance difference in initial testing and retesting of academic achievement among students in the participating schools.

To analyze the research question, related t tests were performed between the means of the variables on the initial testing and the means of the variables on the retesting. An adjusted t was calculated which would compensate for the expected growth of .6 grade equivalents during the elapsed period of six months between initial testing and retesting. Consequently an adjusted t value which is significant indicates more or less, depending on the algebraic sign, that the normal improvement in achievement expected over a period of six months. For each grade, means and standard deviations are included for the initial testing

(pretest) and retesting (posttest). The mean for each variable is the mean of the individual grade equivalents for that variable and can be interpreted as a grade equivalent for that grade.

The findings for grade 3 are reported in Table 7. An adjusted t value of 1.981 was necessary for significance at the .05 level and 2.620

TABLE 7

MEANS, STANDARD DEVIATIONS, t VALUES, AND ADJUSTED t VALUES ON GRADE 3 ITBS TESTS (N=119)

Variable	Pretest		Posttest		t	Adjusted t
	Mean	S.D.	Mean	S.D.		
Vocabulary	3.138	.849	3.861	.846	12.745	1.128
Reading	3.124	1.000	4.068	1.063	12.986	2.646**
Language	2.916	.811	4.168	.972	20.282	5.719**
Workstudy	3.137	.697	3.912	.797	14.578	1.861
Arithmetic	2.992	.690	3.787	.798	14.430	2.074*
Composite	3.054	.705	3.956	.786	22.170	3.212**

*Significant at the .05 level

**Significant at the .01 level

for significance at the .01 level. The adjusted t values were positive for the entire battery, with reading, language, and the composite score significant at the .01 level. The adjusted t for arithmetic was significant at the .05 level. The means on the retesting, which was done in April range from 3.787 for arithmetic to 4.168 for language. The means and the adjusted t values would indicate that the third grade students have as a group made expected or more than the expected gains in academic achievement during the year and are presently at or near grade

level. The null hypothesis was rejected for reading, language, arithmetic, and composite. The null hypothesis was retained for vocabulary and workstudy.

The findings for grade 4 are presented in Table 8. An adjusted t value of 1.993 was necessary for significance at the .05 level and 2.645 at the .01 level. The adjusted t values for grade four are negative for the entire battery with reading significant at the .05 level. The means seem to indicate that the group entered the fourth grade slightly below grade level and fell further behind during the year. Their growth was less than the expected .6 and significantly less in the case of reading, which had a mean of 3.990 in the initial testing and 4.114 in the retesting. The null hypothesis was rejected for reading and retained for the remaining ITBS variables.

TABLE 8

MEANS, STANDARD DEVIATIONS, t VALUES, AND ADJUSTED t VALUES ON
GRADE 4 ITBS TESTS (N=73)

Variable	Pretest		Posttest		t	Adjusted t
	Mean	S.D.	Mean	S.D.		
Vocabulary	3.958	1.026	4.510	1.040	6.830	- .282
Reading	3.990	1.148	4.114	1.196	1.255	-2.479*
Language	3.855	1.053	4.358	1.121	7.452	- .544
Workstudy	3.875	.944	4.268	.988	4.606	-1.310
Arithmetic	3.526	.805	4.084	.748	7.420	- .333
Composite	3.841	.872	4.262	.914	7.952	-1.243

*Significant at the .05 level

**Significant at the .01 level

The findings for grade 5 are reported in Table 9. An adjusted t value of 1.983 was necessary for significance at the .05 level and 2.624 at the .01 level. The adjusted t values were found to be positive for the entire battery, with vocabulary significant at the .01 level and the composite score significant at the .05 level. The means and adjusted t values seem to indicate that the fifth grade as a group has made the expected or more than expected gains in academic achievement and were at or near grade level when retested. The null hypothesis was rejected for vocabulary and composite. The null hypothesis was retained for reading, language, workstudy, and arithmetic.

TABLE 9

MEANS, STANDARD DEVIATIONS, t VALUES, AND ADJUSTED t VALUES ON
GRADE 5 ITBS TESTS (N=103)

Variable	Pretest		Posttest		t	Adjusted t
	Mean	S.D.	Mean	S.D.		
Vocabulary	4.991	1.314	6.073	1.163	13.759	2.835**
Reading	5.055	1.292	5.984	1.189	9.989	1.935
Language	5.036	1.226	5.975	1.262	16.339	1.959
Workstudy	5.148	1.081	6.044	1.114	11.443	1.960
Arithmetic	4.784	.977	5.450	1.117	9.519	.458
Composite	5.007	1.013	5.911	1.022	21.089	2.156*

*Significant at the .05 level

**Significant at the .01 level

The findings for grade six are reported in Table 10. An adjusted t value of 2.002 was necessary for significance at the .05 level and 2.663 at the .01 level. The adjusted t values are positive for vocabulary and arithmetic, but negative for the remainder of the variables.

The adjusted t value for reading is negative and significant at the .05 level. The mean grade equivalent for reading on the retesting (6.243) is lower than the grade equivalent on the initial testing (6.276). The mean grade equivalents on the retesting range from 6.243 on reading to 6.898 on vocabulary. The sixth grade as a group are below grade level except in vocabulary. The null hypothesis was rejected for reading and retained for the remainder of the ITBS variables.

TABLE 10

MEANS, STANDARD DEVIATIONS, t VALUES, AND ADJUSTED t VALUES ON GRADE 6 ITBS TESTS (N=58)

Variable	Pretest		Posttest		t	Adjusted t
	Mean	S.D.	Mean	S.D.		
Vocabulary	6.234	1.441	6.898	1.431	6.240	.240
Reading	6.276	1.498	6.243	1.636	-.324	-2.190*
Language	6.124	1.634	6.407	1.748	3.504	-1.012
Workstudy	6.103	1.747	6.515	1.572	2.662	-.374
Arithmetic	5.593	1.453	6.259	1.403	4.642	.250
Composite	5.986	1.563	6.465	1.415	3.698	-.440

*Significant at the .05 level

**Significant at the .01 level

The findings for grade 7 are reported in Table 11. An adjusted t value of 1.986 was necessary for significance at the .05 level and 2.629 at the .01 level. The adjusted t values were positive for vocabulary and arithmetic, but negative for the remainder of the battery. There were no significant adjusted t values. The mean grade equivalents on the retesting range from 7.152 on language to 7.883 on workstudy

skills. With the exception of workstudy skills and vocabulary the seventh grade as a group was well below grade level when retested. However, there was a good deal of growth in arithmetic. The null hypothesis was retained for all the ITBS variables.

TABLE 11

MEANS, STANDARD DEVIATIONS, t VALUES AND ADJUSTED t VALUES ON GRADE 7 ITBS TESTS (N=95)

Variable	Pretest		Posttest		t	Adjusted t
	Mean	S.D.	Mean	S.D.		
Vocabulary	7.084	1.700	7.818	1.527	7.629	.577
Reading	7.108	1.587	7.456	1.519	3.684	-1.130
Language	6.702	1.745	7.152	1.746	5.696	-.595
Workstudy	7.418	1.407	7.883	1.344	5.660	-.685
Arithmetic	6.580	1.107	7.434	1.346	9.415	1.443
Composite	6.978	1.304	7.547	1.319	12.069	-.164

*Significant at the .05 level

**Significant at the .01 level

The findings for grade 8 are presented in Table 12. An adjusted t value of 1.990 was necessary for significance at the .05 level and 2.638 at the .01 level. The adjusted t values were positive for arithmetic but negative for the remainder of the battery. There were no significant adjusted t values. The mean grade equivalents on the retesting range from 8.305 for language to 9.016 for vocabulary. The eighth grade as a group was at or below grade level when retested. The null hypothesis was retained for all the ITBS variables.

TABLE 12

MEANS, STANDARD DEVIATIONS, t VALUES, AND ADJUSTED t VALUES ON
GRADE 8 ITBS TESTS (N=80)

Variable	Pretest		Posttest		t	Adjusted t
	Mean	S.D.	Mean	S.D.		
Vocabulary	8.449	1.584	9.016	1.492	5.440	- .136
Reading	8.169	1.667	8.714	1.538	3.223	- .218
Language	7.710	1.727	8.305	1.692	6.002	- .018
Workstudy	8.525	1.489	9.012	1.445	5.152	- .491
Arithmetic	7.656	1.260	8.415	1.410	7.157	.760
Composite	8.126	1.294	8.692	1.316	10.333	- .166

*Significant at the .05 level

**Significant at the .01 level

In general the greatest variability occurred at the third grade level with no significant differences at the seventh and eighth grade level. Reading was most frequently in significant differences at the third, fourth, and sixth grade levels.

Analysis of Relationships Between Self Concept and
Academic Achievement on the Initial Tests

Each of the grades were analyzed independently to determine relationships between ten self concept predictors and five academic achievement criterion. The composite scores on the Self Appraisal Inventory (SAI), the School Sentiment Index (SSI), and the Iowa Test of Basic Skills (ITBS) were excluded from this analysis in order to use multivariate techniques requiring matrix computations. In each case the composite score is the arithmetic sum of the other scales in that

particular test thereby creating a linear dependency or singular matrix which does not allow proper mathematical computations with matrix algebra. However, in some cases the computer does not detect this linear dependency due to rounding of numbers or the particular type of internal testing procedures used. In that case results may be obtained which are incorrect and/or difficult to interpret. Therefore the composite scores were excluded to avoid these problems.

A correlation matrix is provided for each of the grades showing the intercorrelations of the ten predictor variables and five criterion variables. The correlations are Pearson product-moment correlations and were obtained as part of the multivariate analysis. Since the variables are numbered in each of the correlation matrices, the following interpretation is given:

1. Peer (SAI)
2. Family (SAI)
3. School (SAI)
4. General (SAI)
5. Teacher (SSI)
6. Subject (SSI) grades 3, 4, and 5
Learning (SSI) grades 6, 7, and 8
7. Structure (SSI)
8. Peer (SSI)
9. General (SSI)
10. Class Play grades 3, 4, and 5
What Would You Do? grades 6, 7, and 8
11. Vocabulary (ITBS)
12. Reading (ITBS)
13. Language (ITBS)

14. Workstudy Skills (ITBS)
15. Arithmetic (ITBS)

Null Hypothesis 3

There is no positive correlation between self concept and academic achievement on the initial tests among students in the participating schools.

To test the null hypothesis, canonical correlations between the ten self concept predictors and the five academic achievement criterion were computed for each grade. Significant correlations were determined by the probability (p) associated with each canonical correlation (R_c). The product factors for the ten predictor and five criterion variables were then interpreted for the significant canonical correlations to determine which variables were contributing the most to the correlation. The product factors represent the correlation coefficients between the original variable and the canonical variables. The coefficients, which can be interpreted like factor loadings, demonstrate the nature of the canonical relationship. The canonical weights, which indicate the relative contribution of each of the original variables to the computation of the composite canonical scores, are also included in the data. The correlation matrix, which is calculated as part of the canonical program, provides evidence regarding the positive or negative relationship between self concept and academic achievement variables.

The findings for grade 3 on the initial testing are reported in Tables 13, 14, and 15. In Table 13 the only significant correlation between the predictor and criterion variables is school with language. This correlation is positive as are most of the non-significant

TABLE 13

CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRITERION VARIABLES FOR GRADE 3 PRETEST

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.414	.479	.378	.113	.290	.318	.402	.233	.298	-.121	.002	.039	-.139	-.047
2		.474	.337	.285	.256	.336	.406	.364	.185	-.021	.113	.191	.070	.116
3			.375	.245	.444	.394	.400	.517	.355	-.021	.151	.223	.019	.012
4				.187	.241	.307	.408	.298	.377	-.131	-.029	.044	-.018	.066
5					.244	.304	.332	.345	-.034	.040	.122	.181	.110	.066
6						.267	.285	.509	.333	.029	.093	.165	-.004	-.025
7							.350	.403	.180	-.078	.022	.051	.012	-.046
8								.373	.287	.049	.175	.166	.020	.057
9									.191	-.098	.021	.062	-.108	-.135
10										-.098	-.078	.005	.004	-.023
11											.740	.619	.664	.598
12												.668	.694	.659
13													.750	.692
14														.725

N = 119 r > .195 needed for significance at the .05 level

TABLE 14

CANONICAL CORRELATIONS AND PRODUCT FACTORS FOR GRADE 3 PRETEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c=.510$	$R_c=.316$	$R_c=.284$	$R_c=.234$	$R_c=.110$		$R_c=.510$	$R_c=.316$	$R_c=.284$	$R_c=.234$	$R_c=.110$
	$p=.003$	$p=.527$	$p=.505$	$p=.621$	$p=.968$		$p=.003$	$p=.527$	$p=.505$	$p=.621$	$p=.968$
Peer	.475	.014	-.649	.120	-.054	Vocabulary	.136	.167	.900	.353	-.135
Family	.379	.616	-.317	.012	.032	Reading	.446	.413	.617	.303	.396
School	.735	.372	-.254	-.314	.050	Language	.461	.725	.425	.035	-.280
General	.073	.469	-.659	.089	.050	Workstudy	-.072	.736	.659	-.086	.103
Teacher	.320	.433	.080	-.305	.008	Arithmetic	-.040	.770	.307	.557	-.001
Learning	.557	.083	-.006	-.255	-.581						
Structure	.226	.186	-.207	-.529	.475						
Peer	.564	.206	-.039	.167	.333						
General	.586	-.121	-.361	-.478	.012						
Class Play	-.064	.225	-.298	-.408	-.262						

TABLE 15

CANONICAL CORRELATIONS AND WEIGHTS FOR GRADE 3 PRETEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .510$	$R_c = .316$	$R_c = .284$	$R_c = .234$	$R_c = .110$		$R_c = .510$	$R_c = .316$	$R_c = .284$	$R_c = .234$	$R_c = .110$
	$p = .003$	$p = .527$	$p = .505$	$p = .621$	$p = .968$		$p = .003$	$p = .527$	$p = .505$	$p = .621$	$p = .968$
Peer	.209	-.374	-.545	.207	-.150	Vocabulary	-.144	-.635	.771	.257	-.410
Family	-.068	.497	-.065	.146	-.099	Reading	.508	-.071	.004	.102	.700
School	.598	.303	.188	-.153	.175	Language	.597	.372	-.198	-.213	-.520
General	-.278	.316	-.474	.284	-.005	Workstudy	-.523	.463	.445	-.631	.262
Teacher	-.015	.313	.123	-.260	-.146	Arithmetic	-.304	.489	-.410	.693	-.047
Learning	.290	.029	.299	.093	-.668						
Structure	-.187	.010	.039	-.450	.498						
Peer	.414	-.078	.376	.431	.410						
General	.186	-.554	-.430	-.348	.071						
Class Play	-.438	.095	-.080	-.497	-.219						

correlations. In Table 14 factor I has a canonical correlation of .510 and a probability of .003. The predictor variables contributing the most to the canonical correlation of factor I are school, learning, peer (SSI), and general (SSI). The criterion variables with the heaviest loadings on factor I are reading and language. The null hypothesis was rejected for grade three.

The findings for grade 4 on the initial testing are reported in Tables 16, 17, and 18. In Table 16 there are several significant correlations at the .05 level between the predictor and criterion variables. Namely, school with vocabulary, reading, and language; and teacher with language. The significant correlations are all positive. However, there are no factors in Table 17 with canonical correlations significant at the .05 level so the null hypothesis was retained for grade 4.

The findings for grade 5 on the initial testing are reported in Tables 19, 20, and 21. In Table 19 there are several significant correlations at the .05 level between the predictor and criterion variables. Namely, school with each of the ITBS variables; general (SAI) with reading, workstudy, and arithmetic; teacher with language; structure with reading; and the Class Play with workstudy and arithmetic. The significant correlations are all positive. In Table 20 factor I has a canonical correlation of .590 and a probability less than .0005. The predictor variable contributing the most to the canonical correlation of factor I is school. The criterion variables which load heaviest on factor I are workstudy and arithmetic, although the coefficients are greater than .55 for all the ITBS variables. The null hypothesis was rejected for grade five.

TABLE 16

CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRITERION VARIABLES FOR GRADE 4 PRETEST

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.401	.302	.330	.233	-.091	.271	.303	.154	.263	.107	-.026	.002	-.054	.054
2		.410	.379	.155	.036	.251	.221	.125	-.041	.000	.006	-.009	-.023	-.024
3			.404	.307	.321	.231	.067	.371	.128	.267	.256	.277	.205	.226
4				.012	.134	.282	.327	.230	.409	-.030	-.090	-.127	-.060	-.053
5					.211	.350	.096	.264	.006	.196	.190	.232	.140	.223
6						.180	-.109	.324	.186	.012	.067	-.027	-.065	.007
7							.281	.315	.236	-.059	.026	.148	.104	.078
8								.105	.260	.174	-.031	-.004	.036	-.128
9									.320	-.089	.023	.078	.043	.117
10										-.103	-.108	-.109	-.112	-.108
11											.702	.665	.620	.558
12												.758	.744	.685
13													.798	.681
14														.771

N = 73 r > .232 needed for significance at the .05 level

TABLE 17

CANONICAL CORRELATIONS AND PRODUCT FACTORS FOR GRADE 4 PRETEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .544$ $p = .066$	$R_c = .469$ $p = .186$	$R_c = .386$ $p = .400$	$R_c = .222$ $p = .915$	$R_c = .139$ $p = .972$		$R_c = .544$ $p = .066$	$R_c = .469$ $p = .186$	$R_c = .386$ $p = .400$	$R_c = .222$ $p = .915$	$R_c = .139$ $p = .972$
Peer	.182	.103	.460	-.464	-.532	Vocabulary	.644	.724	.123	-.029	.217
Family	.029	-.018	.020	.176	-.112	Reading	.111	.734	.063	.458	.486
School	.118	.626	.170	.156	.200	Language	-.054	.981	-.166	.057	.057
General	.125	-.258	.050	-.312	.326	Workstudy	.002	.730	-.328	-.123	.586
Teacher	-.016	.553	.338	-.020	-.081	Arithmetic	-.193	.717	.309	-.231	.548
Learning	.015	-.026	.359	.606	.073						
Structure	-.366	.268	-.280	-.150	-.330						
Peer	.596	-.020	-.446	-.300	-.275						
General	-.428	.159	.111	-.093	.011						
Class Play	-.030	-.234	.012	.017	-.399						

TABLE 18

CANONICAL CORRELATIONS AND WEIGHTS FOR GRADE 4 PRETEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c=.544$	$R_c=.469$	$R_c=.386$	$R_c=.222$	$R_c=.139$		$R_c=.544$	$R_c=.469$	$R_c=.386$	$R_c=.222$	$R_c=.139$
	$p=.066$	$p=.186$	$p=.400$	$p=.915$	$p=.972$		$p=.066$	$p=.186$	$p=.400$	$p=.915$	$p=.972$
Peer	.142	-.025	.618	-.409	-.440	Vocabulary	.826	.150	.155	-.252	-.069
Family	-.136	-.265	-.104	.469	-.193	Reading	-.055	-.081	.139	.854	.324
School	.235	.764	-.158	.168	.168	Language	-.388	.933	-.120	.018	-.736
General	.021	-.389	.173	-.449	.674	Workstudy	.135	-.255	-.744	-.287	.566
Teacher	.063	.249	.287	-.037	.092	Arithmetic	-.383	.187	.624	-.361	.168
Learning	.248	-.253	.344	.454	-.063						
Structure	-.455	.211	-.409	-.093	-.238						
Peer	.658	.056	-.416	-.058	-.118						
General	-.441	-.041	.042	-.234	.107						
Class Play	-.075	-.138	-.101	.330	-.439						

TABLE 19

CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRITERION VARIABLES FOR GRADE 5 PRETEST

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.339	.431	.328	.135	.214	.259	.192	-.053	.267	.017	.080	.031	.111	.165
2		.404	.357	.121	.334	.333	.173	.179	.179	-.054	.014	-.088	-.052	-.032
3			.407	.166	.513	.506	.170	.281	.249	.255	.355	.310	.305	.353
4				.164	.106	.284	.220	.097	.128	.115	.217	.184	.273	.236
5					.174	.377	.538	.212	.035	-.025	.147	.204	.086	.050
6						.459	.097	.349	.285	-.067	.075	.082	-.110	.031
7							.187	.321	.060	.064	.217	.148	-.034	.135
8								.147	.076	-.007	.093	.100	.012	.049
9									.068	-.117	-.049	.062	-.132	-.034
10										.125	.078	.186	.195	.256
11											.718	.639	.601	.589
12												.746	.664	.659
13													.718	.730
14														.707

TABLE 20

CANONICAL CORRELATIONS AND PRODUCT FACTORS FOR GRADE 5 PRETEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .590$	$R_c = .432$	$R_c = .350$	$R_c = .290$	$R_c = .204$		$R_c = .590$	$R_c = .432$	$R_c = .350$	$R_c = .290$	$R_c = .204$
	$p = .000$	$p = .077$	$p = .261$	$p = .401$	$p = .676$		$p = .000$	$p = .077$	$p = .261$	$p = .401$	$p = .676$
Peer	.228	.007	.236	.086	-.836	Vocabulary	.650	.197	.382	.102	.619
Family	-.077	-.053	.302	-.266	-.415	Reading	.579	.616	.412	-.305	.152
School	.494	.520	.361	-.032	-.210	Language	.594	.745	-.148	.106	.245
General	.440	.211	.051	-.240	-.568	Workstudy	.959	.188	-.141	-.160	.018
Teaching	-.002	.638	-.364	-.392	-.144	Arithmetic	.755	.435	.242	.381	-.192
Learning	-.259	.601	.143	.079	-.318						
Structure	-.111	.697	.534	.008	-.197						
Peer	-.042	.390	-.004	-.101	-.161						
General	-.300	.461	-.279	.294	-.100						
Class Play	.368	.132	-.133	.637	-.223						

TABLE 21

CANONICAL CORRELATIONS AND WEIGHTS FOR GRADE 5 PRETEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c=.590$	$R_c=.432$	$R_c=.350$	$R_c=.290$	$R_c=.204$		$R_c=.590$	$R_c=.432$	$R_c=.350$	$R_c=.290$	$R_c=.204$
	$p=.000$	$p=.007$	$p=.261$	$p=.401$	$p=.676$		$p=.000$	$p=.007$	$p=.261$	$p=.401$	$p=.676$
Peer	-.082	-.275	.009	.166	-.729	Vocabulary	.214	-.355	.239	.262	.704
Family	-.197	-.510	.139	-.323	-.068	Reading	-.161	.405	.528	-.636	-.246
School	.708	.305	.184	-.157	.440	Language	-.300	.703	-.616	.215	.366
General	.241	.103	-.167	-.190	-.392	Workstudy	.877	-.463	-.389	-.382	-.128
Teacher	.141	.415	-.566	-.492	-.018	Arithmetic	.265	.030	.367	.578	-.542
Learning	-.421	.401	-.066	-.102	-.284						
Structure	-.200	.439	.629	.260	.103						
Peer	-.140	.143	.233	.141	.064						
General	-.239	.108	-.353	.361	-.138						
Class Play	.285	.051	-.144	.581	.042						

The findings for grade 6 on the initial testing are reported in Tables 22, 23, and 24. In Table 22 there are several significant correlations at the .05 level between the predictor and criterion variables. Namely, school with each of the ITBS variables; teacher with reading, language, and workstudy; structure with each of the ITBS variables; peer (SSI) with reading and language; and general (SSI) with language. In addition to the preceding significant positive correlations, learning and reading correlate significantly and negatively. In Table 23 factor I has a canonical correlation of .687 and a probability of .005. The predictor variables contributing the most to the canonical correlation of factor I are school, teacher, and peer (SSI). The criterion variables with the heaviest loading are reading and workstudy, although the coefficients are greater than .50 for all of the ITBS variables. The null hypothesis was rejected for grade six.

The findings for grade 7 on the initial testing are reported in Tables 25, 26, and 27. In Table 25 there are several significant correlations at the .05 level between the predictor and criterion variables. Namely, school with each of the ITBS variables; peer (SSI) with reading, language, and workstudy; general (SAI) with vocabulary, reading, and workstudy; and What Would You Do? with workstudy. The significant correlations are all positive. In Table 26 factor I has a canonical correlation of .549 and a probability of .006. The predictor variable contributing the most to the canonical correlation of factor I is school. The criterion variables are reading and language, although the coefficients are greater than .65 for all of the ITBS variables. The null hypothesis was rejected for grade seven.

TABLE 22

CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRITERION VARIABLES FOR GRADE 6 PRETEST

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.631	.388	.611	.312	.173	.359	.496	.240	.219	-.060	-.109	-.058	-.122	-.082
2		.459	.518	.544	.190	.471	.568	.401	.234	.174	.125	.167	.062	-.061
3			.478	.547	.058	.528	.614	.440	.050	.344	.411	.402	.283	.268
4				.423	.084	.434	.597	.304	.161	.181	.123	.161	.096	.028
5					.072	.847	.698	.664	.083	.255	.334	.350	.332	.242
6						.135	.016	.105	.052	-.217	-.282	-.240	-.252	-.151
7							.639	.673	.110	.265	.293	.346	.310	.281
8								.490	.162	.220	.356	.325	.243	.159
9									-.010	.249	.192	.269	.256	.165
10										.135	.157	-.052	.134	.058
11											.845	.784	.650	.524
12												.833	.676	.560
13													.683	.600
14														.849

N = 58 r > .261 needed for significance at the .05 level

TABLE 23

CANONICAL CORRELATIONS AND PRODUCT FACTORS FOR GRADE 6 PRETEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .687$	$R_c = .514$	$R_c = .437$	$R_c = .346$	$R_c = .232$		$R_c = .687$	$R_c = .514$	$R_c = .437$	$R_c = .346$	$R_c = .232$
	$p = .005$	$p = .225$	$p = .390$	$p = .608$	$p = .839$		$p = .005$	$p = .225$	$p = .390$	$p = .608$	$p = .839$
Peer	-.210	.053	.132	-.008	-.224	Vocabulary	.653	.491	.096	.471	-.317
Family	.150	.508	.077	-.275	-.275	Reading	.927	.099	.145	.195	-.270
School	.531	.067	.419	.249	-.423	Language	.717	.323	.591	.165	-.071
General	.127	.385	.109	.045	-.193	Workstudy	.739	.208	.079	.435	.465
Teacher	.524	.155	.281	-.016	.388	Arithmetic	.526	-.140	.299	.703	.347
Learning	-.453	-.138	.000	.061	-.156						
Structure	.403	.162	.423	.285	.285						
Peer	.559	.007	.246	-.288	-.058						
General	.255	.471	.231	.197	.358						
What Would You Do?	.284	-.062	-.773	.268	-.161						

TABLE 24

CANONICAL CORRELATIONS AND WEIGHTS FOR GRADE 6 PRETEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .687$	$R_c = .514$	$R_c = .437$	$R_c = .346$	$R_c = .232$		$R_c = .687$	$R_c = .514$	$R_c = .437$	$R_c = .346$	$R_c = .232$
	$p = .005$	$p = .225$	$p = .390$	$p = .608$	$p = .839$		$p = .005$	$p = .225$	$p = .390$	$p = .608$	$p = .839$
Peer	-.593	-.343	.110	.093	.128	Vocabulary	-.341	.492	-.201	.569	-.399
Family	.038	.575	.008	-.337	-.364	Reading	.819	-.579	-.304	-.287	-.375
School	.398	-.107	.245	.355	-.535	Language	-.085	.246	.786	-.306	.130
General	-.074	.402	-.117	.122	-.026	Workstudy	.396	.384	-.408	-.301	.811
Teacher	.224	-.250	-.285	-.238	.697	Arithmetic	-.223	-.464	.287	.640	-.160
Learning	-.367	-.179	-.034	-.016	-.088						
Structure	.020	.037	.601	.510	-.048						
Peer	.437	-.354	.055	-.584	-.112						
General	-.125	.391	-.171	.142	.232						
What Would You Do?	.302	-.069	-.662	.241	-.047						

TABLE 25

CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRITERION VARIABLES FOR GRADE 7 PRETEST

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.486	.490	.633	.281	.038	.392	.297	.153	.395	.191	.046	.064	.118	.038
2		.524	.652	.459	.159	.467	.347	.395	.369	.093	.100	.045	.145	-.013
3			.562	.583	.174	.660	.269	.520	.453	.382	.385	.358	.387	.303
4				.388	.111	.505	.131	.276	.391	.184	.085	-.009	.108	.060
5					.315	.761	.449	.617	.486	.159	.174	.182	.195	.067
6						.210	.122	.236	.274	-.051	.009	-.046	-.024	-.007
7							.375	.604	.511	.158	.139	.164	.161	.125
8								.293	.276	.183	.234	.259	.221	.104
9									.389	.272	.230	.199	.238	.156
10										.165	.198	.158	.200	.136
11											.787	.655	.654	.535
12												.718	.723	.563
13													.780	.681
14														.728

N = 95 r > .200 needed for significance at the .05 level

TABLE 26

CANONICAL CORRELATIONS AND PRODUCT FACTORS FOR GRADE 7 PRETEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .549$	$R_c = .406$	$R_c = .309$	$R_c = .251$	$R_c = .077$		$R_c = .549$	$R_c = .406$	$R_c = .309$	$R_c = .251$	$R_c = .077$
	$p = .006$	$p = .208$	$p = .560$	$p = .689$	$p = .996$		$p = .006$	$p = .208$	$p = .560$	$p = .689$	$p = .996$
Peer	.145	.583	-.404	.117	.315	Vocabulary	.815	.543	-.011	.042	-.200
Family	.173	.111	-.525	-.537	.354	Reading	.938	-.016	.102	-.252	-.217
School	.757	.232	-.071	-.096	.409	Language	.902	-.136	-.085	.383	.115
General	.129	.608	-.071	-.445	.190	Workstudy	.860	.088	-.175	-.134	.452
Teacher	.357	-.004	-.443	-.069	.011	Arithmetic	.698	.117	.491	.135	.489
Learning	-.036	-.143	.202	-.317	-.036						
Structure	.306	.112	-.096	.136	.339						
Peer	.474	-.169	-.378	.092	-.409						
General	.449	.328	-.186	-.109	.018						
What Would You Do?	.367	.040	-.069	-.279	.343						

TABLE 27

CANONICAL CORRELATIONS AND WEIGHTS FOR GRADE 7 PRETEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .549$	$R_c = .406$	$R_c = .309$	$R_c = .251$	$R_c = .077$		$R_c = .549$	$R_c = .406$	$R_c = .309$	$R_c = .251$	$R_c = .077$
	$p = .006$	$p = .208$	$p = .560$	$p = .689$	$p = .996$		$p = .006$	$p = .208$	$p = .560$	$p = .689$	$p = .996$
Peer	-.200	.428	-.377	.483	.176	Vocabulary	.119	.776	-.103	.211	-.248
Family	-.192	-.371	-.430	-.400	.404	Reading	.773	-.475	.325	-.527	-.523
School	.798	-.117	.220	-.004	.215	Language	.571	-.388	-.225	.700	-.179
General	-.039	.539	.362	-.479	-.456	Workstudy	.248	.117	-.588	-.427	.724
Teacher	-.071	-.095	-.579	-.051	-.254	Arithmetic	.029	.090	.698	.082	.331
Learning	-.144	-.087	.219	-.142	-.038						
Structure	-.327	-.211	.319	.535	.435						
Peer	.334	-.132	.027	.040	-.476						
General	.130	.522	-.026	-.027	-.192						
What Would You Do?	.155	-.152	.086	-.255	.185						

The findings for grade 8 on the initial testing are reported in Tables 28, 29, and 30. In Table 28 there are several significant correlations at the .05 level between the predictor and criterion variables. Namely, school with each of the ITBS variables; teacher with reading; structure with vocabulary and reading; and general (SSI) with vocabulary, reading, and workstudy. The significant correlations are all positive. In Table 29 factor I has a canonical correlation of .634 and a probability of .001. The predictor variable contributing the most to the canonical correlation of factor I is school. The criterion variables which load the heaviest are vocabulary and language, although the coefficients are greater than .70 for all the ITBS variables. The null hypothesis was rejected for grade eight.

In the initial tests, the correlation matrices seem to indicate some general patterns. To begin with, the significant correlations between predictor and criterion variables are positive with only one exception. Most of the non-significant correlations are also positive.

The correlation matrices seem to indicate that the school scale on the Self Appraisal Inventory is the best single self concept predictor of academic achievement, as measured by the Iowa Test of Basic Skills. The school variable correlates positively and significantly with all the ITBS variables for grades five, six, seven, and eight. It also correlates positively and significantly with vocabulary, reading, and language at the fourth grade and with language at the third grade. The correlations also indicate that as students get older teacher, structure, and peer become more important in relation to achievement in reading, language, and workstudy.

TABLE 28

CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRITERION VARIABLES FOR GRADE 8 PRETEST

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.312	.311	.624	-.097	-.339	.187	.376	.069	.173	.032	-.061	.019	-.079	-.088
2		.209	.409	.253	.057	.295	.267	.300	.151	.074	.089	-.061	-.077	-.092
3			.476	.420	.061	.430	.227	.455	.384	.513	.420	.448	.404	.404
4				.106	-.110	.273	.287	.222	.258	.106	.105	-.039	-.018	-.041
5					.172	.571	.109	.500	.272	.216	.359	.159	.207	.147
6						.239	-.136	.177	.215	-.022	.005	-.024	.005	.065
7							.399	.596	.358	.235	.268	.199	.187	.104
8								.316	.111	.166	.186	.039	-.034	-.106
9									.500	.221	.336	.110	.222	.088
10										.145	.087	.047	.071	-.012
11											.617	.670	.584	.473
12												.456	.562	.455
13													.655	.625
14														.788

N = 80 r > .217 needed for significance at the .05 level

TABLE 29

CANONICAL CORRELATIONS AND PRODUCT FACTORS FOR GRADE 8 PRETEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .634$	$R_c = .449$	$R_c = .295$	$R_c = .237$	$R_c = .175$		$R_c = .634$	$R_c = .449$	$R_c = .295$	$R_c = .237$	$R_c = .175$
	$p = .001$	$p = .183$	$p = .768$	$p = .844$	$p = .897$		$p = .001$	$p = .183$	$p = .768$	$p = .844$	$p = .897$
Peer	-.031	-.077	-.482	.268	-.062	Vocabulary	.862	.187	-.372	.083	.278
Family	-.008	.368	-.458	-.193	.021	Reading	.706	.661	.149	-.084	-.188
School	.867	.149	-.185	-.077	.171	Language	.869	-.258	-.019	.345	-.240
General	.051	.347	-.351	-.204	.300	Workstudy	.774	.023	.512	.207	.308
Teacher	.385	.560	.211	-.014	-.353	Arithmetic	.796	-.275	.426	-.319	.084
Learning	.013	-.053	.140	-.451	-.002						
Structure	.368	.363	-.043	.385	-.174						
Peer	.117	.526	-.616	.244	-.292						
General	.317	.664	.222	.284	.222						
What Would You Do?	.123	.225	-.240	.320	.538						

TABLE 30

CANONICAL CORRELATIONS AND WEIGHTS FOR GRADE 8 PRETEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .634$	$R_c = .449$	$R_c = .295$	$R_c = .237$	$R_c = .175$		$R_c = .634$	$R_c = .449$	$R_c = .295$	$R_c = .237$	$R_c = .175$
	$p = .001$	$p = .183$	$p = .768$	$p = .844$	$p = .897$		$p = .001$	$p = .183$	$p = .768$	$p = .844$	$p = .897$
Peer	-.183	-.401	.007	.266	-.428	Vocabulary	.578	.059	-.720	-.133	.502
Family	-.008	.042	-.375	-.176	.076	Reading	.274	.741	.179	-.123	-.405
School	.906	-.311	-.191	-.198	.121	Language	.512	-.408	-.098	.397	-.571
General	-.278	.454	.060	-.436	.362	Workstudy	-.109	.214	.658	.548	.506
Teacher	-.075	.365	.171	-.195	-.556	Arithmetic	.563	-.484	.087	-.714	-.053
Learning	-.126	-.141	.016	-.474	-.184						
Structure	.164	-.229	.022	.537	-.050						
Peer	-.005	.383	-.527	-.038	-.273						
General	-.064	.427	.609	.163	.243						
What Would You Do?	-.127	-.004	-.376	.299	.432						

Significant canonical factors existed for all but fourth grade. Consequently the null hypothesis was retained for grade four and rejected for the rest of the grades. The significant canonical factors all had the variable school loading heavily as a predictor which would support the interpretation of the correlation matrix. Peer (SSI) also appeared as an important predictor.

Analysis of Relationships Between Self Concept and
Academic Achievement on the Retests

Each of the grades were analyzed independently to determine relationships between ten self concept predictors and five academic achievement criterion. The tables, data reported, and methods of analysis and interpretation are the same as on the initial testing data.

Null Hypothesis 4

There is no positive correlation between self concept and academic achievement on the retests among students in the participating schools.

The null hypothesis was tested in the same manner as the hypothesis dealing with self concept and academic achievement on the initial testing. The findings for grade 3 on the retesting are reported in Tables 31, 32, and 33. The only significant correlations between predictor and criterion variables are school with vocabulary and language. These correlations are positive as are most of the non-significant correlations. However, there are no canonical factors significant at the .05 level so the null hypothesis was retained.

The findings for grade 4 on the retesting are reported in Tables 34, 35, and 36. In Table 34 there are several significant correlations at the .05 level between the predictor and criterion variables. Namely, school with each of the ITBS variables; and peer (SSI) with language and

TABLE 31

CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRITERION VARIABLES FOR GRADE 3 POSTTEST

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.434	.395	.254	.381	.227	.346	.469	.282	.298	.035	.045	.028	.081	.054
2		.330	.360	.348	.268	.286	.352	.180	.151	.111	.091	.122	.130	.072
3			.382	.382	.499	.481	.378	.393	.356	.214	.163	.218	.185	.122
4				.372	.192	.226	.298	.135	.322	.112	.066	.039	.061	.108
5					.334	.459	.403	.366	.182	.134	.126	.165	.133	.106
6						.378	.393	.485	.274	.081	-.022	.020	-.063	-.091
7							.537	.410	.182	.144	.156	.152	.131	.126
8								.266	.098	.143	.065	.089	.054	.129
9									.146	.011	-.035	.059	-.058	-.061
10										.007	.059	.074	.077	-.018
11											.708	.663	.631	.674
12												.733	.722	.690
13													.766	.747
14														.776

N = 119 r > .195 needed for significance at .05 level

TABLE 32

CANONICAL CORRELATIONS AND PRODUCT FACTORS FOR GRADE 3 POSTTEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .361$	$R_c = .312$	$R_c = .263$	$R_c = .165$	$R_c = .093$		$R_c = .361$	$R_c = .312$	$R_c = .263$	$R_c = .165$	$R_c = .093$
	$p = .345$	$p = .502$	$p = .635$	$p = .931$	$p = .985$		$p = .345$	$p = .502$	$p = .635$	$p = .931$	$p = .985$
Peer	.050	.271	-.032	-.184	-.316	Vocabulary	.351	.359	.809	-.283	.117
Family	.373	.158	.191	-.188	-.327	Reading	.449	.632	.295	-.070	.554
School	.607	.129	.531	-.238	-.083	Language	.705	.395	.451	.364	.107
General	-.126	.259	.426	-.179	.004	Workstudy	.562	.786	.198	-.036	-.159
Teacher	.396	.155	.325	.087	.140	Arithmetic	.124	.779	.537	.300	.008
Learning	.267	-.565	.408	-.477	.186						
Structure	.283	.264	.341	.007	.616						
Peer	-.052	.125	.666	.132	-.026						
General	.288	-.505	.220	.360	.094						
Class Play	.424	.022	-.261	-.116	.098						

TABLE 33

CANONICAL CORRELATIONS AND WEIGHTS FOR GRADE 3 POSTTEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .361$	$R_c = .312$	$R_c = .263$	$R_c = .165$	$R_c = .093$		$R_c = .361$	$R_c = .312$	$R_c = .263$	$R_c = .165$	$R_c = .093$
	$p = .345$	$p = .502$	$p = .635$	$p = .931$	$p = .985$		$p = .345$	$p = .502$	$p = .635$	$p = .931$	$p = .985$
Peer	-.309	.206	-.397	-.292	-.249	Vocabulary	.025	-.279	.721	-.484	-.145
Family	.350	.028	-.060	-.022	-.283	Reading	-.010	.301	-.330	-.140	.812
School	.534	.271	.461	-.073	-.326	Language	.623	-.547	.177	.587	.010
General	-.489	.130	.273	-.144	.099	Workstudy	.367	.502	-.481	-.426	-.564
Teacher	.316	.127	.046	.132	.059	Arithmetic	-.690	.530	.331	.469	-.028
Learning	-.138	-.639	.106	-.631	.199						
Structure	.006	.404	-.123	-.098	.794						
Peer	-.195	.011	.587	.391	-.222						
General	.050	-.527	-.014	.540	-.094						
Class Play	.314	-.028	-.424	.138	.100						

TABLE 34

CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRITERION VARIABLES FOR GRADE 4 POSTTEST

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.137	.573	.385	.024	.126	.261	.356	-.004	.369	.155	.190	.226	.150	.200
2		.394	.289	.252	.163	.187	.196	.151	.078	.228	.092	.083	.050	.031
3			.472	.272	.223	.378	.369	.304	.318	.460	.280	.309	.289	.314
4				.144	.128	.301	.257	.132	.179	.064	.027	.019	.042	.144
5					.135	.374	.261	.313	-.047	.073	-.134	-.105	.033	-.091
6						.383	.013	.345	.272	.105	.165	.175	.058	.044
7							.197	.460	.104	-.034	-.117	-.064	-.006	.006
8								.097	-.025	.118	.167	.237	.240	.125
9									.035	-.003	-.082	-.058	-.021	.011
10										.021	-.019	-.014	-.079	.008
11											.818	.739	.650	.606
12												.842	.740	.702
13													.764	.743
14														.781

N = 73 r > .232 needed for significance at the .05 level

TABLE 35

CANONICAL CORRELATIONS AND PRODUCT FACTORS FOR GRADE 4 POSTTEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .623$	$R_c = .567$	$R_c = .358$	$R_c = .260$	$R_c = .111$		$R_c = .623$	$R_c = .567$	$R_c = .358$	$R_c = .260$	$R_c = .111$
	$p = .005$	$p = .015$	$p = .539$	$p = .806$	$p = .990$		$p = .005$	$p = .015$	$p = .539$	$p = .806$	$p = .990$
Peer	.014	.345	.286	.323	-.450	Vocabulary	.653	.732	.141	-.003	.152
Family	.410	.164	-.032	-.391	-.217	Reading	.128	.891	.227	.107	.357
School	.693	.420	.247	.317	-.336	Language	.118	.921	.101	.330	-.142
General	.171	-.071	.451	.345	.098	Workstudy	.258	.627	-.133	.655	.310
Teacher	.507	-.240	-.611	.069	-.069	Arithmetic	.237	.505	.488	.662	.118
Learning	-.121	.384	.017	-.270	-.347						
Structure	.174	-.219	-.066	.362	-.602						
Peer	-.045	.391	-.425	.562	-.211						
General	.184	-.180	.065	.172	-.377						
Class Play	.078	-.040	.324	-.232	-.633						

TABLE 36

CANONICAL CORRELATIONS AND WEIGHTS FOR GRADE 4 POSTTEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .623$	$R_c = .567$	$R_c = .358$	$R_c = .260$	$R_c = .111$		$R_c = .623$	$R_c = .567$	$R_c = .358$	$R_c = .260$	$R_c = .111$
	$p = .005$	$p = .015$	$p = .539$	$p = .806$	$p = .990$		$p = .005$	$p = .015$	$p = .539$	$p = .806$	$p = .990$
Peer	-.308	.106	.155	.037	-.252	Vocabulary	.793	-.059	-.013	-.332	-.097
Family	.091	.031	-.045	-.605	-.194	Reading	-.548	.513	.266	-.519	.629
School	.811	.516	.247	.280	.134	Language	-.222	.756	-.185	.082	-.712
General	-.087	-.263	.472	.235	.469	Workstudy	.104	-.065	-.647	.613	.294
Teacher	.295	-.256	-.597	-.130	.160	Arithmetic	.100	-.396	.690	.488	-.038
Learning	-.238	.512	-.093	-.334	.062						
Structure	-.008	-.341	-.087	.337	-.528						
Peer	-.282	.276	-.506	.423	-.162						
General	-.091	-.220	.237	.106	-.204						
Class Play	-.002	-.290	.074	-.259	-.533						

workstudy. The significant correlations are all positive. In Table 35 factor I has a canonical correlation of .623 and a probability of .005. The predictor variables contributing the most to the canonical correlation for factor II is school. The criterion variables are reading and language, although the coefficients are greater than .50 for all of the ITBS variables. The null hypothesis was rejected for grade four.

The findings for grade 5 on the retesting are reported in Tables 37, 38, and 39. In Table 37 there are several significant correlations at the .05 level between the predictor and criterion variables. Namely, school with each of the ITBS variables; general (SAI) with vocabulary; teacher with vocabulary; general (SSI) with language; and the Class Play with each of the ITBS variables.

In Table 38 factor I has a canonical correlation of .603 with a probability less than .0005. The predictor variables contributing the most to the canonical correlation of factor I are school, learning, general (SSI), and the Class Play. The criterion variables are language and arithmetic. Factor II has a canonical correlation of .499 with a probability of .008. The predictor variable contributing the most to the canonical correlation of factor II is teacher. The criterion variable is vocabulary. Factor III has a canonical correlation of .440 and a probability of .026. The predictor variable contributing the most to the canonical correlation of factor III is peer (SAI), which is negative. The criterion variables are language and workstudy, although vocabulary and reading also have coefficients greater than .50. The null hypothesis was rejected for grade five.

The findings for grade 6 on the retesting are reported in Tables 40, 41, and 42. In Table 40 there are several significant correlations

TABLE 37

CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRITERION VARIABLES FOR GRADE 5 POSTTEST

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.395	.463	.056	.199	.152	.428	.455	.108	.289	-.014	-.062	-.016	-.046	.162
2		.432	.219	.340	.157	.285	.219	.065	.335	.170	.165	.179	.140	.182
3			.347	.259	.437	.469	.337	.405	.282	.217	.238	.271	.212	.375
4				.255	.176	.314	.146	.240	.022	.211	.095	.101	.060	.073
5					.271	.479	.374	.235	.272	.207	.118	.045	.083	.234
6						.385	.226	.432	.191	-.025	.145	.127	.003	.186
7							.504	.388	.244	.068	-.038	.001	-.054	.064
8								.201	.213	.069	.046	.136	.097	.196
9									.113	.025	.145	.246	.088	.272
10										.254	.195	.305	.258	.365
11											.716	.621	.630	.547
12												.701	.766	.685
13													.790	.760
14														.813

N = 103 r > .195 needed for significance at the .05 level

TABLE 38

CANONICAL CORRELATIONS AND PRODUCT FACTORS FOR GRADE 5 POSTTEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .603$	$R_c = .499$	$R_c = .440$	$R_c = .253$	$R_c = .201$		$R_c = .603$	$R_c = .499$	$R_c = .440$	$R_c = .253$	$R_c = .201$
	$p = .000$	$p = .008$	$p = .026$	$p = .614$	$p = .692$		$p = .000$	$p = .008$	$p = .026$	$p = .614$	$p = .692$
Peer	.433	.309	-.418	-.424	-.088	Vocabulary	.284	.483	.689	.372	-.281
Family	.282	.069	.238	.192	-.278	Reading	.472	-.061	.543	.689	.059
School	.667	.165	.134	.137	-.188	Language	.595	-.200	.772	-.011	-.082
General	.085	.267	.254	.157	-.738	Workstudy	.424	.083	.765	.187	.440
Teacher	.412	.581	-.132	.306	-.171	Arithmetic	.860	.161	.394	.087	.269
Learning	.538	-.328	-.309	.343	-.389						
Structure	.205	.289	-.157	-.238	-.598						
Peer	.358	.114	.055	-.372	.008						
General	.640	-.309	-.064	-.152	-.397						
Class Play	.561	.262	.377	-.255	-.116						

TABLE 39

CANONICAL CORRELATIONS AND WEIGHTS FOR GRADE 5 POSTTEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .603$	$R_c = .499$	$R_c = .440$	$R_c = .253$	$R_c = .201$		$R_c = .603$	$R_c = .499$	$R_c = .440$	$R_c = .253$	$R_c = .201$
	$p = .000$	$p = .008$	$p = .026$	$p = .614$	$p = .692$		$p = .000$	$p = .008$	$p = .026$	$p = .614$	$p = .692$
Peer	.232	.223	-.642	-.355	-.029	Vocabulary	-.103	.614	.247	-.004	-.364
Family	-.104	-.338	.232	.196	-.192	Reading	.104	-.420	-.221	.885	-.038
School	.398	.252	.287	.338	.399	Language	.148	-.556	.437	-.431	-.477
General	-.114	.180	.168	.017	-.560	Workstudy	-.548	.134	.615	-.127	.795
Teacher	.280	.582	-.241	.456	.227	Arithmetic	.810	.346	-.566	-.123	.078
Learning	.187	-.413	-.357	.398	-.207						
Structure	-.548	.147	-.075	-.293	-.539						
Peer	.105	-.203	.288	-.287	.283						
General	.469	-.381	-.011	-.313	-.144						
Class Play	.344	.150	.387	-.298	-.058						

TABLE 40

CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRITERION VARIABLES FOR GRADE 6 POSTTEST

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.469	.464	.660	.401	.053	.490	.497	.310	.573	.080	.031	.057	.042	.094
2		.557	.658	.321	.027	.415	.352	.402	.481	.292	.204	.187	.170	.184
3			.551	.552	.105	.479	.245	.518	.401	.232	.153	.224	.168	.137
4				.372	-.017	.372	.367	.266	.513	.262	.210	.183	.182	.092
5					.074	.732	.563	.559	.393	.159	.036	.104	.048	.020
6						.152	.008	.167	-.044	-.230	-.217	-.176	-.230	-.080
7							.644	.676	.433	.187	.186	.278	.202	.212
8								.422	.442	.188	.122	.238	.241	.206
9									.456	.220	.294	.396	.302	.244
10										.043	.128	.152	.116	.082
11											.811	.686	.762	.579
12												.811	.839	.662
13													.888	.785
14														.843

N = 58 r > .261 needed for significance at the .05 level

TABLE 41

CANONICAL CORRELATIONS AND PRODUCT FACTORS FOR GRADE 6 POSTTEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .639$	$R_c = .482$	$R_c = .352$	$R_c = .314$	$R_c = .215$		$R_c = .639$	$R_c = .482$	$R_c = .352$	$R_c = .324$	$R_c = .215$
	$p = .025$	$p = .357$	$p = .764$	$p = .738$	$p = .884$		$p = .025$	$p = .357$	$p = .764$	$p = .738$	$p = .884$
Peer	-.050	.205	.342	-.050	.007	Vocabulary	.486	.748	.210	.263	.301
Family	.078	.544	.479	.310	.169	Reading	.714	.221	.321	.434	.387
School	.221	.461	.319	.037	-.461	Language	.831	.230	.506	-.007	.018
General	.259	.424	-.003	.316	.044	Workstudy	.794	.291	.304	-.122	.423
Teacher	.064	.487	.105	.006	-.694	Arithmetic	.447	.184	.714	-.234	.449
Learning	-.385	-.274	.337	-.119	-.407						
Structure	.280	.227	.594	-.001	-.389						
Peer	.302	.349	.214	-.540	-.049						
General	.554	.091	.526	.092	-.491						
What Would You Do?	.266	-.146	.155	.110	-.120						

TABLE 42

CANONICAL CORRELATIONS AND WEIGHTS FOR GRADE 6 POSTTEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .639$	$R_c = .482$	$R_c = .352$	$R_c = .314$	$R_c = .215$		$R_c = .639$	$R_c = .482$	$R_c = .352$	$R_c = .324$	$R_c = .215$
	$p = .025$	$p = .357$	$p = .764$	$p = .738$	$p = .884$		$p = .025$	$p = .357$	$p = .764$	$p = .738$	$p = .884$
Peer	-.384	.019	.299	-.092	.152	Vocabulary	-.282	.836	.025	.054	-.090
Family	-.333	.470	.398	.233	.445	Reading	.080	-.537	.097	.750	.307
School	.150	.169	.084	-.380	-.285	Language	.414	.067	.297	-.014	-.788
General	.412	.069	-.485	.348	.038	Workstudy	.677	-.091	-.745	-.657	.464
Teacher	-.426	.453	-.408	.210	-.703	Arithmetic	-.534	-.013	.589	-.063	.250
Learning	-.273	-.239	.100	-.088	-.281						
Structure	.129	-.274	.539	.227	.110						
Peer	.240	.243	-.107	-.741	.242						
General	.467	-.097	.127	.120	-.202						
What Would You Do?	.046	-.583	-.126	.070	-.110						

at the .05 level between the predictor and criterion variables. Namely, family with vocabulary; general (SAI) with vocabulary; structure with language; and general (SSI) with reading, language, and workstudy. The significant correlations are all positive. In Table 41 factor I has a canonical correlation of .639 and a probability of .025. The predictor variable contributing the most to the canonical correlation of factor I is general (SSI). The criterion variables are reading, language, and workstudy. The null hypothesis was rejected for grade six.

The findings for grade 7 on the retesting are reported in Tables 43, 44, and 45. In Table 43 there are several significant correlations at the .05 level between the predictor and criterion variables. Namely, peer (SAI) with reading and language; school with each of the ITBS variables; teacher with each of the ITBS variables; structure with reading, language, workstudy, and arithmetic; peer (SSI) with reading, language, workstudy, and arithmetic; and general (SSI) with vocabulary, reading, workstudy, and arithmetic. In addition to the above positive correlations, learning correlated significantly and negatively with vocabulary and workstudy.

In Table 44 factor I has a canonical correlation of .585 and a probability of .001. The predictor variables contributing the most to the canonical correlation of factor I are school and teacher. The criterion variables are reading and language, although the coefficients are greater than .75 for all the ITBS variables. The null hypothesis was rejected for grade seven.

The findings for grade 8 on the retesting are reported in Tables 46, 47, and 48. In Table 46 there are several significant positive correlations at the .05 level between the predictor and criterion variables.

TABLE 43

CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRITERION VARIABLES FOR GRADE 7 POSTTEST

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.348	.564	.619	.280	-.288	.295	.449	.183	.391	.171	.253	.204	.182	.195
2		.432	.564	.455	.040	.449	.268	.371	.423	.082	.119	.099	.101	.052
3			.552	.568	-.111	.467	.323	.510	.429	.398	.451	.445	.409	.442
4				.317	-.071	.321	.374	.273	.324	.103	.182	.025	.145	.131
5					.142	.629	.366	.519	.448	.273	.315	.321	.247	.267
6						.168	.009	.114	.166	-.210	-.138	-.164	-.225	-.086
7							.388	.666	.567	.102	.244	.230	.271	.234
8								.113	.373	.157	.341	.231	.264	.244
9									.442	.202	.256	.197	.280	.238
10										.077	.164	.157	.161	.130
11											.771	.692	.672	.548
12												.785	.827	.725
13													.737	.698
14														.792

N = 95 r > .200 needed for significance at the .05 level

TABLE 44

CANONICAL CORRELATIONS AND PRODUCT FACTORS FOR GRADE 7 POSTTEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c=.585$	$R_c=.404$	$R_c=.371$	$R_c=.290$	$R_c=.185$		$R_c=.585$	$R_c=.404$	$R_c=.371$	$R_c=.290$	$R_c=.185$
	$p=.001$	$p=.215$	$p=.232$	$p=.531$	$p=.806$		$p=.001$	$p=.215$	$p=.232$	$p=.531$	$p=.806$
Peer	.390	.098	-.302	-.070	.305	Vocabulary	.799	.020	.118	.547	.220
Family	.164	.129	.021	-.088	.428	Reading	.886	.311	-.222	.047	.259
School	.840	.061	-.161	.114	-.140	Language	.952	-.139	.157	-.197	.108
General	.156	.480	-.398	.245	.107	Workstudy	.827	.519	.196	-.005	-.089
Teacher	.576	-.074	-.151	.002	.268	Arithmetic	.843	.180	-.198	-.006	-.467
Learning	-.274	-.242	-.618	-.269	-.245						
Structure	.400	.366	-.024	-.528	-.087						
Peer	.450	.416	-.458	-.357	.490						
General	.407	.391	-.004	.084	-.105						
What Would You Do?	.263	.178	-.024	-.332	.167						

TABLE 45

CANONICAL CORRELATIONS AND WEIGHTS FOR GRADE 7 POSTTEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .585$	$R_c = .404$	$R_c = .371$	$R_c = .290$	$R_c = .185$		$R_c = .585$	$R_c = .404$	$R_c = .371$	$R_c = .290$	$R_c = .185$
	$p = .001$	$p = .215$	$p = .232$	$p = .531$	$p = .806$		$p = .001$	$p = .215$	$p = .232$	$p = .531$	$p = .806$
Peer	-.061	-.371	-.338	-.161	.238	Vocabulary	.276	-.222	.160	.798	-.015
Family	-.087	-.171	.255	-.136	.395	Reading	.227	.312	-.665	-.198	.657
School	.827	-.232	-.008	.003	-.501	Language	.808	-.553	.281	-.534	.139
General	-.382	.543	-.300	.413	-.188	Workstudy	-.089	.714	.581	-.112	-.102
Teacher	.152	-.334	-.055	.318	.366	Arithmetic	.460	-.195	-.340	.164	-.734
Learning	-.194	-.286	-.690	-.142	-.175						
Structure	-.006	.225	.255	-.703	-.454						
Peer	.294	.336	-.329	-.136	.336						
General	.032	.353	-.092	.382	.115						
What Would You Do?	-.103	.046	.264	-.065	.068						

TABLE 46

CORRELATION MATRIX OF PREDICTOR VARIABLES AND CRITERION VARIABLES FOR GRADE 8 POSTTEST

	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.436	.545	.816	.302	-.109	.299	.299	.226	.324	-.019	-.076	-.050	.006	-.095
2		.408	.486	.441	.097	.400	.242	.286	.333	.012	.121	-.018	.072	.070
3			.563	.593	.148	.453	.277	.525	.546	.403	.331	.380	.461	.406
4				.349	.054	.368	.262	.335	.361	.045	-.011	-.013	.079	-.010
5					.232	.722	.415	.690	.474	.108	.151	.157	.205	.108
6						.243	.157	.244	.232	.037	.165	.094	.113	.068
7							.501	.716	.521	.070	.058	.062	.062	-.032
8								.410	.234	-.078	-.112	-.152	-.024	-.058
9									.491	.158	.182	.191	.204	.141
10										.197	.206	.207	.245	.159
11											.762	.678	.629	.541
12												.732	.772	.653
13													.747	.648
14														.817

N = 80 r > .217 needed for significance at the .05 level

TABLE 47

CANONICAL CORRELATIONS AND PRODUCT FACTORS FOR GRADE 8 POSTTEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .657$	$R_c = .404$	$R_c = .328$	$R_c = .238$	$R_c = .124$		$R_c = .657$	$R_c = .404$	$R_c = .328$	$R_c = .238$	$R_c = .124$
	$p = .000$	$p = .383$	$p = .612$	$p = .838$	$p = .980$		$p = .000$	$p = .383$	$p = .612$	$p = .838$	$p = .980$
Peer	-.057	-.430	.126	.494	.286	Vocabulary	.803	.011	.207	-.125	.545
Family	.010	.393	-.250	.454	.525	Reading	.665	.568	.248	.210	.362
School	.742	-.167	.129	.466	.254	Language	.772	.218	.583	-.021	-.125
General	.064	-.380	-.012	.567	.453	Workstudy	.843	.148	.123	.502	-.022
Teaching	.199	.016	.306	.681	.040	Arithmetic	.891	.315	-.230	.086	-.218
Learning	.043	.428	.211	.470	.179						
Structure	.032	-.118	.352	.326	.591						
Peer	-.088	-.324	-.385	.499	.159						
General	.259	.079	.303	.367	.179						
What Would You Do?	.311	.007	.304	.512	.416						

TABLE 48

CANONICAL CORRELATIONS AND WEIGHTS FOR GRADE 8 POSTTEST

	I	II	III	IV	V		I	II	III	IV	V
	$R_c = .657$	$R_c = .404$	$R_c = .328$	$R_c = .238$	$R_c = .124$		$R_c = .657$	$R_c = .404$	$R_c = .328$	$R_c = .238$	$R_c = .124$
	$p = .000$	$p = .383$	$p = .612$	$p = .838$	$p = .980$		$p = .000$	$p = .383$	$p = .612$	$p = .838$	$p = .980$
Peer	-.449	-.038	.530	.109	-.174	Vocabulary	.591	-.418	-.127	-.262	.605
Family	-.057	.630	-.338	.024	.245	Reading	-.465	.749	.059	.114	.415
School	.864	-.138	-.134	-.215	.104	Language	.168	.019	.739	-.284	-.551
General	.040	-.433	-.328	.260	.219	Workstudy	.248	-.457	.087	.829	.022
Teacher	-.148	-.027	.198	.465	-.569	Arithmetic	.587	.234	-.653	-.388	-.397
Learning	-.091	.324	.168	.270	.033						
Structure	-.112	-.294	.343	-.508	.694						
Peer	-.046	-.273	-.527	.242	-.061						
General	.030	.357	.094	-.107	-.184						
What Would You Do?	.027	.018	.084	.239	.090						

Namely, school with each of the ITBS variables. In Table 47 factor I has a canonical correlation of .657 and a probability less than .0005. The predictor variable contributing the most to the canonical correlation of factor I is school. The criterion variables are workstudy and arithmetic, although the coefficients are greater than .65 for all of the ITBS variables. The null hypothesis was rejected for grade eight.

In the retest data, the correlation matrices again indicate some general relationships. The significant correlations are again positive with two exceptions. Learning correlated negatively and significantly with vocabulary and workstudy. In the initial testing learning correlated negatively and significantly with reading. Most of the non-significant correlations between the ten predictor and five criterion were also positive.

While there is a little more variety as to which variables correlate significantly, the school scale on the Self Appraisal Inventory again seems to be the best single self concept predictor of academic achievement as measured by the Iowa Test of Basic Skills. The school variable correlates positively and significantly with all the ITBS variables for grades four, five, seven, and eight and with vocabulary and language for grade three.

Again teacher, structure, and peer become more important to the older students. While this seemed to be true for grades six, seven, and eight in the initial test, it was also true for the fifth grade on the retests. Reading, language, and workstudy again seemed to be the more important criterion for the older students.

Significant canonical factors existed for all but grade three. Consequently the null hypothesis was retained for grade three and

rejected for the remaining grades. Grade five had three significant factors and grade four had two significant factors. The variable school loaded heavily in at least one factor for grades four, five, seven, and eight which would tend to reinforce the previous interpretation about this variable. Teacher also appeared to important as a predictor.

Analysis of Relationships Between Initial Testing and Retesting of Teacher Perception of the Students

Torrance's Ideal Child Checklist (ICC) was administered to the teachers in the fall (initial testing) and again in the spring (retesting) as part of a battery of evaluative instruments. The ICC was used in an attempt to answer questions regarding the teachers' perception of the students.

Null Hypothesis 5

There is no difference in the initial testing and retesting of teacher perception of the students in the participating schools.

The individual ICC tests were scored according to Torrance's system of weights. Two points were assigned to characteristics which the teacher indicated he would highly encourage, one point to those characteristics he would encourage, minus one point for those characteristics he would discourage, and zero points for no response. Means and standard deviations were then calculated for each characteristic using the weighted scores. The individual characteristics were then ranked according to their mean score. The mean score for an individual characteristic can be interpreted as an indication of the group perception of that characteristic according to the previously defined point system.

To analyze the hypothesis, a related t test was performed between the means of the characteristics on the initial testing and the means of the characteristics on the retesting. The resulting ranks, means, standard deviations, and t values are reported in Table 49.

Both fall and spring the teachers as a group encouraged quite strongly characteristics such as asking questions, considerate, curious, healthy, and sincere. Characteristics which the teachers as a group felt should be discouraged included negativistic, timid, stubborn, fearful, and fault-finding. In general characteristics which had positive means in the fall had higher means in the spring. In fact all the characteristics having a mean of one or greater in the fall, had an equal or higher mean in the spring.

A t value of 1.989 was necessary for significance at the .05 level and 2.636 at the .01 level. Three characteristics had t values which are significant at the .01 level. They are: affectionate, which moved up from rank 18 to rank 12; remember well, which moved up from rank 29.5 to 24; and guessing, which moved up from rank 47 to 36.5. Four characteristics have t values significant at the .05 level. They are: self-sufficient, which changed ranks from 28 to 25.5; never bored, which changed ranks from 38 to 33; talkative, which changed ranks from 44.5 to 49; and conforming, which changed ranks from 54 to 53. It should be noted that while conforming had a significantly higher mean in the spring it, unlike the other significant variables, had a lower rank in the spring. The t values of the remaining 59 characteristics were non-significant.

Except for the above seven characteristics the null hypothesis was retained. In general then, the teachers changed very little, as

TABLE 49

PRETEST AND POSTTEST TEACHER RANKING OF THE CHARACTERISTICS ON THE IDEAL CHILD CHECKLIST (N=83)

Characteristic	Pretest			Posttest			t
	Rank	Mean	S.D.	Rank	Mean	S.D.	
Asking Questions	1.5	1.795	.488	2	1.855	.354	1.000
Considerate	1.5	1.795	.406	1	1.880	.328	1.470
Curious	3	1.747	.437	3	1.783	.415	.686
Healthy	4	1.699	.462	5	1.699	.535	.000
Sincere	5	1.651	.480	6	1.651	.480	.000
Courteous	6	1.566	.628	4	1.711	.530	1.880
Altruistic	7	1.542	.570	7	1.639	.554	1.379
Self-starting	8	1.530	.570	9	1.566	.499	.505
Self-confident	9.5	1.518	.571	12	1.554	.500	.555
Sense of humor	9.5	1.518	.503	12	1.544	.500	.575
Independent thinking	11	1.506	.503	8	1.602	.492	1.524
Socially well-adjusted	12	1.494	.571	12	1.554	.500	.799
Versatile	13	1.470	.570	15.5	1.506	.503	.520

TABLE 49--Continued

Characteristic	Pretest			Posttest			t
	Rank	Mean	S.D.	Rank	Mean	S.D.	
Courageous in conviction	14	1.434	.499	12	1.554	.500	1.791
Independent judgment	15	1.410	.495	15.5	1.506	.527	1.471
Asking questions	16.5	1.398	.492	20	1.398	.562	.000
Receptive to ideas	16.5	1.398	.562	20	1.398	.562	.000
Affectionate	18	1.373	.487	12	1.554	.500	3.025**
Industrious	19.5	1.349	.480	22	1.386	.559	.555
Sense of beauty	19.5	1.349	.551	20	1.398	.562	.851
Doing work on time	21.5	1.337	.668	18	1.410	.625	.786
Energetic	21.5	1.337	.547	23	1.373	.578	.402
Truthful	23	1.313	.661	17	1.422	.566	1.534
Intuitive	24	1.229	.502	28	1.241	.458	.185
Neat and orderly	25	1.205	.676	25.5	1.301	.599	1.303
Thorough	26	1.181	.472	27	1.265	.444	1.305
Persistent	27	1.169	.601	29.5	1.205	.558	.575

TABLE 49--Continued

Characteristic	Pretest			Posttest			t
	Rank	Mean	S.D.	Rank	Mean	S.D.	
Self-sufficient	28	1.108	.494	25.5	1.301	.599	2.549*
Physically strong	29.5	1.084	.389	32	1.169	.601	1.262
Remembering well	29.5	1.084	.474	24	1.337	.547	3.596**
Willing to take risks	31	1.048	.516	29.5	1.205	2.163	.680
Striving for distant goals	32	1.024	.680	31	1.193	.671	1.802
Popular	33	1.000	.541	35	1.024	.517	.498
Self-assertative	34	.988	.529	40.5	.976	.584	-.217
Desirous of excelling	35.5	.976	.796	34	1.084	.719	1.319
Visionary	35.5	.976	.517	38.5	.988	.615	.179
Adventurous	37	.940	.722	38.5	.988	.634	.664
Never bored	38	.916	.752	33	1.157	.788	2.390*
Prefer complex tasks	39	.904	.637	36.5	1.012	.455	1.451
Refined	40	.867	.658	40.5	.976	.624	1.291
Feeling emotions strongly	41.5	.831	.730	46.5	.687	.882	-1.403
Unwilling to accept on mere say-so	41.5	.831	.867	44	.855	.899	.199

TABLE 49--Continued

Characteristic	Pretest			Posttest			t
	Rank	Mean	S.D.	Rank	Mean	S.D.	
Spirited in disagreement	43	.819	.718	45	.759	.820	-.575
Talkative	44.5	.795	.639	49	.554	.845	-2.191*
Willing to accept authority	44.5	.795	.639	42	.928	.536	1.657
Liking to work alone	46	.735	.682	43	.880	.613	1.682
Guessing	47	.723	.941	36.5	1.012	.848	2.683**
Competitive	48.5	.639	.774	48	.675	.828	.491
Regressing	48.5	.639	.864	50.5	.506	.916	-1.143
Obedient	50	.590	.898	52	.422	.964	-1.692
Emotionally sensitive	51	.470	1.004	46.5	.687	1.047	-1.928
Determined	52	.386	1.022	50.5	.506	.980	.844
Reserved	53	.277	.967	54	.313	.949	.340
Conforming	54	.084	1.002	53	.386	.961	2.273*
Becoming preoccupied with tasks	55	.012	1.076	55	-.217	.988	-1.846
Quiet	56	-.277	.979	56	-.265	.964	.090
Critical of others	57	-.590	.856	57	-.446	.978	1.242

TABLE 49--Continued

Characteristic	Pretest			Posttest			t
	Rank	Mean	S.D.	Rank	Mean	S.D.	
Haughty	58	-.651	.788	60.5	-.747	.660	-1.016
Unsophisticated	59	-.735	.682	59	-.723	.704	.139
Disturbing procedures	60	-.747	.696	62	-.807	.573	-.609
Domineering	61.5	-.783	.626	58	-.639	.790	1.488
Fault-finding	61.5	-.783	.626	60.5	-.747	.660	.410
Fearful	63	-.855	.521	63.5	-.867	.488	-.185
Stubborn	64.5	-.880	.479	63.5	-.867	.488	.241
Timid	64.5	-.880	.479	65	-.892	.442	-.185
Negativistic	66	-.916	.447	66	-.976	.220	-1.092

*Significant at the .05 level

**Significant at the .01 level

measured by the Ideal Child Checklist, in their perception of the students. It then become a subjective decision on the part of the school and its administration to determine which characteristics the teachers should highly encourage, encourage, or discourage.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to investigate the direction and degree of relationship between self concept and academic achievement of students in two Grand Forks Public Schools during the 1971-72 school year. A second purpose was to determine the amount and direction of change in the teachers' perception of the students during that year. The subjects were students attending and staff employed by two public schools participating in a "Human Awareness through Self Enhancing Education" project. The student sample was limited to students in grades three through eight, attending their respective school for the entire year, and completing all the initial tests and retests. The staff sample consisted of all staff employed in their respective school for the entire year and completing the initial test and retest.

The following five research questions were proposed and investigated in this study.

1. Is there a difference in initial testing and retesting of self concept among students in the participating schools?
2. Is there a difference in initial testing and retesting of academic achievement among students in the participating schools?

3. Is there a positive correlation between self concept and academic achievement on the initial tests among students in the participating schools?

4. Is there a positive correlation between self concept and academic achievement on the retests among students in the participating schools?

5. Is there a difference in the initial testing and retesting of teacher perception of the students in the participating schools?

The subjects included in the data analysis for this study consisted of 528 elementary students and 83 staff members in two public schools located on the Grand Forks Air Base, Grand Forks, North Dakota. Grades three, five, seven, and eight at Nathan Twining Elementary and four, six, seven, and eight at Carl Ben Eielson Elementary were selected for the research population. The data for this study was collected during the 1971-72 school year.

Self concept in grades three, four, and five was measured on a pre and post basis by the primary Self Appraisal Inventory (SAI), the primary School Sentiment Index (SSI), and the Class Play (CP). Self concept in grades six, seven, and eight was measured on a pre and post basis by the intermediate Self Appraisal Inventory (SAI), the intermediate School Sentiment Index (SSI), and What Would You Do? (WWYD). The preceding instruments were developed and distributed by the Instructional Objectives Exchange. The Self Appraisal Inventory is a direct self report test dealing with self concept along four dimensions or scales: (1) general, (2) family, (3) peer, (4) school. The School Sentiment Index is a direct self report test dealing with attitudes towards school along five dimensions or scales: (1) teacher, (2)

subject or learning (3) structure, (4) peer, (5) general. A composite score on the SAI and the SSI was used in analyzing the relationship between initial testing and retesting of self concept. The Class Play and What Would You Do? are inferential self reports with a single score.

Academic achievement was measured, on a pre and post basis, by the Iowa Test of Basic Skills (ITBS). Equivalent forms were used for the initial test and the retest. The vocabulary, reading, language, workstudy skills, arithmetic, and composite scores were used in interpreting the students' academic achievement.

Teacher perception of students was measured, on a pre and post basis, by Torrance's Ideal Child Checklist (ICC). The Ideal Child Checklist consists of sixty-six characteristics which the teacher checks to indicate those characteristics of students which should be highly encouraged, encouraged, or discouraged. Using Torrance's weighted scoring system the sixty-six characteristics were ranked for the teachers as a group.

The statistical procedures consisted of Pearson product-moment correlations, canonical correlations, and related t tests. The .01 and .05 levels were used for interpreting and evaluating the significance of the findings.

The findings of this study are summarized in the same order in which they were presented in Chapter IV. The research questions were stated in null form in Chapter IV to facilitate analysis of the data.

1. With self concept measured by the Instructional Objectives Exchange instruments, related t tests were performed on the variables independently at each grade level.

- a. The difference between means was negative and significant at the .01 or .05 level for all the scales on the SAI, the peer and composite scales on the SSI, and the Class Play. The null hypothesis was rejected for all SAI variables peer and composite, and the Class Play. The third grade students generally had a lower or less positive self concept at the end of the school year.
- b. The differences between means, although mostly negative, were non-significant at the .05 level except for the school scale on the SAI. The null hypothesis was rejected for the school variable on the SAI. This would seem to indicate little or no change in students' self concept during the fourth grade.
- c. The difference between means was negative and significant at the .01 or .05 level for the peer and composite scales on the SAI, the subject scale on the SSI, and the Class Play. The family scale on the SAI was positive and significant at the .05 level. The null hypothesis was rejected for the peer, family, and composite variables on the SAI, subject variable on the SSI, and the Class Play. It appears that during the course of the year the self concept of fifth grade students as related to themselves, their peers, and their school subjects declined, but their self concept in relation to their family improved.
- d. The differences between means, although mostly negative, were non-significant at the .05 level except for the learning scale on the SSI. The null hypothesis was

rejected for the learning variable on the SSI. This would indicate little or no change in student self concept during the sixth grade.

- e. The difference between means was negative and significant at the .05 level for the structure scale on the SSI. The rest of the differences between means was non-significant and mostly negative. The null hypothesis was rejected for the structure variable on the SSI. Very little if any changes in self concept occurred during the seventh grade.
- f. The difference between means was positive and significant at the .01 level for the structure scale on the SSI. The null hypothesis was rejected for the structure variable on the SSI. This would seem to indicate a positive change in attitude toward the school's organizational structure during the eighth grade.

2. With academic achievement measured by the Iowa Test of Basic Skills, related t tests were performed on the variables independently at each grade level. An adjusted t value was calculated which would compensate for the expected growth of .6 grade equivalents during the elapsed period of six months between initial testing and retesting. Consequently an adjusted t value which is significant indicates more or less than the normal achievement expected over a period of six months.

- a. The adjusted t values were positive for the entire battery with reading, language, arithmetic, and the composite score significant at the .01 or .05 level. The null hypothesis was rejected for reading, language, arithmetic, and composite.

The means and adjusted t values indicate that the third grade students have as a group made expected or more than expected gains in academic achievement during the year and are presently at or near grade level.

- b. The adjusted t values for grade four are negative for the entire battery with reading significant at the .05 level. The null hypothesis was rejected for reading. The means indicate that the group entered the fourth grade slightly below grade level and fell further behind during the year. Their growth was less than the expected .6 and significantly less in the case of reading which had a mean of 3.990 in the initial testing and 4.114 in the retesting.
- c. The adjusted t values were found to be positive for the entire battery, with vocabulary and composite significant at the .01 or .05 level. The null hypothesis was rejected for vocabulary and composite. The means and adjusted t values indicate that the fifth grade as a group has made the expected or more than expected gains in academic achievement and were at or near grade level when retested.
- d. The adjusted t values are positive for vocabulary and arithmetic, but negative for the remainder of the variables. The adjusted t value for reading is negative and significant at the .05 level. The null hypothesis was rejected for reading. The sixth grade as a group was below grade level except in vocabulary, when retested.
- e. The adjusted t values were positive and non-significant for vocabulary and arithmetic, but negative and non-

significant for the remainder of the battery. Therefore the null hypothesis was retained for all the ITBS variables. With the exception of workstudy skills and vocabulary the seventh grade as a group was well below grade level when retested. However, there was a good deal of growth in arithmetic during the year.

- f. The adjusted t values were positive and non-significant for arithmetic, but negative and non-significant for the remainder of the battery. Therefore the null hypothesis was retained for all the ITBS variables. The eighth grade as a group was at or below grade level when retested.

3. To test the null hypothesis on the initial tests of self concept and achievement, canonical correlations between the ten self concept predictors and the five academic achievement criterion were computed for each grade. The composite scores were omitted due to the linear dependency with the other scales.

- a. Factor I has a canonical correlation of .510 and a probability of .003. The predictor variables contributing the most to the correlation are school, learning, peer (SSI), and general (SSI). The criterion variables are reading and language. The null hypothesis was rejected for grade three.
- b. There were no factors with canonical correlations significant at the .05 level. The null hypothesis was retained for grade four.

- c. Factor I has a canonical correlation of .590 and a probability less than .0005. The predictor variable contributing the most to the correlation is school and the criterion variables are workstudy and arithmetic. The null hypothesis was rejected for grade five.
- d. Factor I has a canonical correlation of .687 and a probability of .005. The predictor variables contributing the most to the correlation are school, teacher, and peer (SSI). The criterion variables are reading and workstudy. The null hypothesis was rejected for grade six.
- e. Factor I has a canonical correlation of .549 and a probability of .006. The predictor variable contributing the most to the correlation is school and the criterion variables are reading and language. The null hypothesis was rejected for grade seven.
- f. Factor I has a canonical correlation of .634 and a probability of .001. The predictor variable contributing the most to the correlation is school and the criterion variables are vocabulary and language. The null hypothesis was rejected for grade eight.

4. To test the null hypothesis on the retests of self concept and achievement, canonical correlations between the ten self concept predictors and the five academic achievement criterion were computed for each grade. The composite scores were omitted due to the linear dependency with the other scales.

- a. There were no factors significant at the .05 level. The null hypothesis was retained for grade three.

- b. Factor I has a canonical correlation of .623 and a probability of .005. The predictor variables contributing the most to the correlation are school and teacher. The criterion variable is vocabulary. A second factor has a correlation of .567 and a probability of .015 with the variables school, reading, and language contributing heavily to the correlation. The null hypothesis was rejected for grade four.
- c. Factor I has a canonical correlation of .603 with a probability less than .0005. The predictor variables contributing the most to the correlation are school, learning, general (SSI), and the Class Play. The criterion variables are language and arithmetic. A second factor has a correlation of .499 and a probability of .008 with the variables teacher and vocabulary contributing heavily to the correlation. A third factor has a correlation of .440 and a probability of .026 with the variables peer (SAI), language, and workstudy contributing heavily to the correlation. The null hypothesis was rejected for grade five.
- d. Factor I has a canonical correlation of .639 and a probability of .025. The predictor variable contributing the most to the correlation is general (SSI). The criterion variables are reading, language, and workstudy. The null hypothesis was rejected for grade six.
- e. Factor I has a canonical correlation of .585 and a probability of .001. The predictor variables contributing the most to the correlation are school and teacher. The criterion

variables are reading and language. The null hypothesis was rejected for grade seven.

- f. Factor I has a canonical correlation of .657 and a probability less than .0005. The predictor variable contributing the most to the correlation is school. The criterion variables are workstudy and arithmetic. The null hypothesis was rejected for grade eight.

5. On the initial test and retest using the Ideal Child Checklist the teachers as a group encouraged quite strongly characteristics such as: asking questions, considerate, curious, healthy, and sincere. Characteristics which the teachers felt should be discouraged included negativistic, timid, stubborn, fearful, and fault-finding. In general characteristics which had positive means in the initial test had higher means in the retest.

To analyze the hypothesis, a related t test was performed between the means of the characteristics on the initial testing and the means of the characteristics on the retesting. The characteristics: affectionate, remember well, and guessing, have t values which are significant at the .01 level. The characteristics: self sufficient, never bored, talkative, and conforming, have t values significant at the .05 level. The t values of the remaining 59 characteristics were non-significant.

Except for the above seven characteristics the null hypothesis was retained. In general then, the teachers changed very little, as measured by the Ideal Child Checklist, in their perception of the students.

Relationship of the Present Study to Related Research

Studies dealing with the relationship between self concept and achievement are rather limited, although this has become an area of

increasing interest since 1960. Most of the studies, such as Shaw, Edison, and Bell (1960), Fink (1962), and Walsh (1956) have dealt with underachievers or such as Jacobs and Felix (1966) and Murray (1966) with the disadvantaged. In addition several studies, such as Campbell (1965), Bledsoe (1967), and Baum (1968) have dealt with sex differences. In this study self concept was measured using the general school population, without regard to prior achievement, disadvantaged status, or sex differences, and tested as a predictor of achievement.

While studies of self concept have covered a variety of variables related to self concept, there is a general lack of long-term longitudinal studies on the relationship between self concept and achievement. One exception is the rather extensive studies by Brookover and associates (1962, 1964, 1965, 1967). The data used in the present study is available for other studies on different variables and for use as a base line for future or longitudinal studies.

There was a great deal of disagreement among the researchers as to the effectiveness of any one approach, instrument, or battery of instruments to measure self concept. A wide variety of measuring techniques were used including the Self Concept Checklist (Bledsoe, 1964), Thematic Apperception Test (LaVerd, 1961), perceptual tests (Malpass, 1953), Driscoll Play Kit (Walsh, 1956), and Manchover Draw-A-Person Test (Bruck and Bodwin, 1962). In this study, using Instructional Objectives Exchange instruments, significant changes in self concept determined by test-retest t values indicated that the Self Appraisal Inventory and the Class Play were more effective instruments at the third, fourth, and fifth grade level. However, the significant changes in self concept at the fifth, sixth, and seventh grade level were

indicated primarily by the School Sentiment Index. On both of the initial tests and the retests, the zero-order and canonical correlations indicate that the school scale on the Self Appraisal Inventory is the best single self concept predictor of achievement. While public schools traditionally administer achievement tests, it is suggested that some group instrument measuring self concept be included in the regular evaluation program.

In this study, on both the initial tests and retests, the significant zero-order correlations between the ten predictor (self concept) and five criterion (achievement) variables were found to be positive except for learning. Learning correlated negatively with reading on the initial tests and with vocabulary and workstudy on the retests. The correlations, significant and non-significant, were predominately positive indicating a positive although not necessarily significant relationship between self concept and achievement. These conclusions coincide with the general studies by Purkey (1970) which show a positive but not always significant relationship. Brookover, Patterson, and Thomas (1964), Coopersmith (1959), and Bledsoe (1964) obtained similar findings.

Although it was not the original intent of this study to investigate the age variable in relation to self concept, since the data was analyzed independently for each of the grades, some of the findings and conclusions were related to age. The greatest changes in self concept occurred at the third grade and fifth grade level and they were negative except for one scale. Students in grades four, six, seven, and eight showed significant changes on one scale each. These changes were negative except for eighth grade. This is not necessarily supportive

of Morse's (1964) conclusion that self concept decreases with age, but it does seem to indicate increasing stability of self concept with age accompanied by increasing difficulty in changing self concept.

Studies by Videbeck (1960), Rosen, Levinger and Lippitt (1960), and Russell (1953) have demonstrated the persistent and positive relationship between the perceptions of the student by significant others and the student's self concept. Consequently many schools have made serious attempts to alter or enhance the students' self concept in order to increase their achievement. These attempts have been made through parents (Helper, 1958), teachers (Davidson and Lang, 1960), and counselors (Hamcheck, 1968). However, Brookover, Patterson, and Thomas (1965), Hamcheck (1968), and Usitalo (1967) found that the perceptions of the student by significant others are slow to change, as is the student's self concept. The HATSEE program is based on the assumption that the teacher is a significant other and an attempt was made to change the student's self concept through the teacher. While no attempt was made, in this study, to identify or evaluate the specific perceptions of the student held by the teacher, the findings indicated that the teachers as a group changed very little in their perception of desirable or undesirable characteristics of the student. This inability to effect rapid change in the perceptions of the student held by the teacher, would suggest the need for a sustained program accompanied by longitudinal research.

Conclusions

In summary, the following major conclusions emerged from this study:

1. During the school year, 1971-72, the greatest changes in student self concept occurred at the third and fifth grade level. The significant changes in self concept were negative for third grade except for the Class Play and negative for fifth grade except for the family variable. In contrast, students in grades four, six, seven, and eight showed significant changes during the year on only one variable each. The change was negative for school in fourth, negative for learning in sixth, negative for structure in seventh, and positive for structure in eighth.

2. Significant changes in self concept for grades three, four, and five were indicated primarily by the Self Appraisal Inventory and the Class Play, instruments which were designed to measure or display positive self concepts. However, the significant changes in self concept for grades six, seven, and eight were indicated primarily by the School Sentiment Index, an instrument which was designed to measure attitudes toward school in general and toward several dimensions of school.

3. In grades three, four, and five there was an increasing number of positive, but not necessarily significant, t values on the self concept variables corresponding to the students increase in age. The same trend occurs for grades six, seven, and eight.

4. The adjusted t values for all the variables of the Iowa Test of Basic Skills were positive for grades three and five with reading, language, and arithmetic significant for third grade. The adjusted t values for grades four, six, seven, and eight were generally negative with the reading variable significant in fourth and sixth grade and no significant variables in grades seven and eight.

5. On both the initial tests and retests the significant zero-order correlations between the ten predictor (self concept) and five criterion (achievement) variables were positive except for learning. Learning correlated negatively with reading on the initial tests and with vocabulary and workstudy on the retest. The correlations also indicate that as students get older; teacher, structure, and peer became more important in relation to achievement in reading, language, and workstudy.

6. On both the initial tests and retests the zero-order correlations seem to indicate that the school scale on the Self Appraisal Inventory is the best single self concept predictor of academic achievement as measured by the Iowa Test of Basic Skills. On the initial test the school variable correlated positively and significantly with language in third grade; vocabulary, reading, and language in the fourth grade; and all of the variables in grades five, six, seven, and eight. On the retest the school variable correlated positively and significantly with language in third grade and all the variables in grades four, five, seven, and eight.

7. The teachers as a group changed very little, as measured by the Ideal Child Checklist, in their perception of desirable and undesirable characteristics of students. Only seven of the sixty-six characteristics had significant t values. The seven significant t values were positive and included the characteristics: affectionate, remember well, guessing, self-sufficient, never bored, talkative, and conforming.

Recommendations

The following recommendations, for further research, are being presented in an effort to provide suggestions for the improvement of

educational programs in the Grand Forks School District and to provide a better understanding of the relationship between self concept and academic achievement.

1. The zero order correlations on both test and retest show a generally positive, but not necessarily significant, relationship between self concept and achievement. However, the significant t (or adjusted t) values between test and retest shows a tendency toward an inverse relationship between self concept and academic achievement. Therefore, it is recommended that this study be replicated in an attempt to clarify the relationship between self concept and achievement.

2. One of the conclusions of this study was that the greatest changes in self concept took place at the third and fifth grade level and that these changes were generally negative. However, the third and fifth graders show positive changes in academic achievement.

The preceding findings seem to indicate the "key" or "pivotal" nature of the third and fifth grades. This would seem to have important implications for the organizational structure of the elementary school and resulting climate. It is recommended that further research be undertaken to determine if this is a consistent pattern or due to some other factor in the original design of this study, such as the way in which the original sample was selected.

3. Significant changes in self concept were indicated primarily by the Self Appraisal Inventory and the Class Play for grades three, four, and five and by the School Sentiment Index for grades six, seven, and eight. Also in grades three, four, and five and again in grades six, seven, and eight a trend toward increasing number of positive, but

not necessarily significant, t values on the self concept variables corresponding to increasing age occurs. But is this a clear age trend or a function of the selection of tests and levels used in this study to measure self concept? Consequently, it is recommended that further studies be conducted to determine which of the Instructional Objectives Exchange instruments provides the best measure of the students' self concept at the respective grade levels.

4. Both the zero-order correlations and the canonical factors indicate that the school variable on the Self Appraisal Inventory may be the best single self concept predictor of academic achievement. The research recommendation in the preceding suggestion could easily be expanded to include research in an attempt to determine a single self concept predictor for academic achievement.

5. The teachers as a group changed very little, as measured by the Ideal Child Checklist, in their perception of the desirable and undesirable characteristics of students. This stability is not surprising nor necessarily undesirable and any replication of this study would be likely to produce very similar results. Since the desirability or undesirability of individual characteristics is a subjective decision it seems appropriate to identify individual characteristics in terms of the objectives of the HATSEE program. Then is it possible to modify the teachers' perception of the individual characteristics to conform to the HATSEE objectives?

While this study merely attempted to measure the stability or lack of stability of the teachers' perceptions of the students, it is recommended that research be undertaken to determine the feasibility

of modifying the teachers' perceptions of specific characteristics to conform with the objectives of the HATSEE program in order to improve or promote student self concept.

The Randolph Program

Randolph and Howe (1966), contend that involving the student in his own educational developments is vital if self enhancement is to occur. They have listed twelve processes by which children are guided to become totally involved with their own development. These twelve self-enhancing processes are:

1. Involving the student and teacher in differentiating and confronting problems, and to develop personal responsibility for carrying out solutions that will resolve conflict and increase acceptance.
2. Centering management within each individual; to overcome the effects of imposition and control; and to exercise the innate power of each individual to be in charge of self.
3. Changing negative reflections to positive images in order to overcome the perception children have of adults seeing children as unworthy, weak and inadequate.
4. Building bonds of trust by daring to risk confrontation of feelings and making communications clear and congruent.
5. Setting limits and expectation and defining specific intellectual areas within which children can feel free and safe to explore.
6. Freeing and channeling energy to work in productive directions.
7. Overcoming unproductive repetitive behavior that interferes with learning.
8. Helping children assume social responsibility and come to understand the difference between tattling and reporting.
9. Enabling children to overcome the low self esteem that results from their feelings of physical inadequacy.
10. Making success inevitable by producing feelings of adequacy in children through successive academic achievements.
11. Encouraging self evaluation that will result in self improvement rather than forcing the child to work for adult approval.

12. Breaking curriculum barriers to enable children to move through curricular experiences at a rate compatible with their own abilities.

Randolph and Howe have theorized that utilization of these processes will help children feel stronger and more confident about themselves as individuals with unique abilities. A feeling of acceptance and understanding within the peer group is seen as a result of individual realization and appreciation of personal resources. Essentially then, it is the aim of Self Enhancing Education to defeat failure by providing opportunities for each child to exercise, modify, and expand perceptions about himself and those around him.

REFERENCES

- Barrett, H. O. An intensive study of 32 gifted children. Personnel Guidance Journal, 1957, 36, 192-194.
- Baum, M., ed. Unified effort of a junior high school faculty to "encourage success" for seventh-graders. October, 1968 (Reporting Res.: Oregon Board of Education).
- Bledsoe, J. C. Self-concepts of children and their intelligence, achievement, interests and anxiety. Journal of Individual Psychology, 1964, 20, 55-58.
- Bledsoe, J. C. Self-concept of children and their intelligence, achievement, interests, and anxiety. Childhood Education, 1967, 43, 436-438.
- Bloom, B. S., ed. Taxonomy of educational objectives, the classification of educational goals, handbook I: Cognitive domain. New York: David McKay Company, Inc., 1956.
- Brookover, W. B., and Gottlieb, D. A sociology of education. New York: American Book Co., 1964.
- Brookover, W. B., Erickson, E. L., and Joiner, L. M. Self-concept of ability and school achievement III: Relationship of self-concept to achievement in high school. Final Report. East Lansing: Michigan State University, College of Education, 1967, ERIC ED 010 796.
- Brookover, W. B., Patterson, A., and Thomas, S. Self-concept of ability and school achievement I: Relationship of self-image to achievement in junior high school subjects. East Lansing: Michigan State University, College of Education, 1962, ERIC ED 002 946.
- Brookover, W. B., Patterson, A., and Thomas, S. Self-concept of ability and school achievement. Sociology of Education, 1964, 37, 271-278.
- Brookover, W. B., Patterson, A., and Thomas, S. Self-concept of ability and school achievement II: Improving academic achievement through students' self concept enhancement. East Lansing: Michigan State University, College of Education, 1965, ERIC ED 003 294.
- Bruck, M., and Bodwin, R. F. The relationship between self-concept and the presence and absence of scholastic underachievement. Journal of Clinical Psychology, 1962, 18, 181-182.

- Buros, O. K., ed. Fifth mental measurements yearbook. New Brunswick, New Jersey: Rutgers University, School of Education, 1959.
- Campbell, P. B. Self-concept and academic achievement in middle grade public school children. Unpublished Ph.D. dissertation, Wayne State University, 1965.
- Caplin, M. D. The relationship between self concept and academic achievement and between level of aspiration and academic achievement. Dissertation Abstracts, 1966, 27, 979-A.
- Carter, T. P. The negative self concept of Mexican-American students. School and Society, 1968, 96, 217-219.
- Combs, A. W. A perceptual view of the adequate personality. Perceiving, Behaving, Becoming. 1962 Yearbook of the Association for Supervision and Curriculum Development. Washington, D. C.: Association for Supervision and Curriculum Development, 1962.
- Combs, A. W. The relationship of child perceptions to achievement and behavior in the early school years. Gainesville: Florida University, 1963, ERIC ED 002 944.
- Combs, A. W., and Snygg, D. Individual behavior. New York: Harpers, 1959.
- Cooley, W. W., and Lohnes, P. R. Multivariate data analysis. New York: John Wiley and Sons, Inc., 1971.
- Coopersmith, S. A method for determining types of self esteem. Journal of Abnormal Social Psychology, 1959, 59, 87-94.
- Davidson, H. H., and Lang, G. Children's perceptions of their teachers' feelings toward them related to self-perception, school achievement, and behavior. Journal of Experimental Education, 1960, 29, 107-118.
- Fink, M. A. Self-concept as it relates to academic achievement. California Journal of Educational Research, 1962, 13, 57-62.
- Fliegler, L. A. Understanding the underachieving gifted child. Psychological Report, 1957, 3, 533-536.
- Fox, D. J. Expansion of the more effective school program. New York, New York: Center for Urban Education, 1967, ERIC ED 014 525.
- Hamcheck, D. E. Characteristics of low-achieving, low self-concept junior high school students and the impact of small group and individual counseling on self-concept enhancement and achievement. 1968, ERIC ED 017 549.
- Helper, M. M. Parental evaluations of children and children's self-evaluations. Journal of Abnormal and Social Psychology, 1958, 56, 190-194.

- Instructional Objectives Exchange. Measures of self concept. Los Angeles: Instructional Objectives Exchange, 1970a.
- Instructional Objectives Exchange. Attitude toward school. Los Angeles: Instructional Objectives Exchange, 1970b.
- Jacobs, J. N., and Felix, J. L., eds. Evaluation of the impact of the elementary and secondary education act in the Cincinnati Public Schools. Cincinnati, Ohio: Cincinnati Public Schools, Ohio Department of Instruction, 1966, ERIC ED 022 813.
- Kerensky, V. M. Reported self concept in relation to academic achievement in an inner-city setting. Dissertation Abstracts, 1967, 27, 23-25.
- Kowitz, G. T. Test anxiety and self concept. Childhood Education, 1967, 44, 162-165.
- LaVerd, J. The relationship of the achievement motives as projected into TAT stories to children's school achievement. Unpublished Ph.D. dissertation, Utah State University, 1961.
- Lesser, G. S., and Abelson, R. P. Personality correlates of persuasibility in children. Personality and Persuasibility. Edited by C. I. Hoveland and J. L. Janis. New Haven: Yale University Press, 1959.
- Malpass, L. F. Some relationships between students' perceptions of school and their achievement. Journal of Educational Psychology, 1953, 44, 475-482.
- Mead, G. H. Mind, self and society. Chicago: University of Chicago Press, 1934.
- Morse, W. C. Self concept in the school setting. Childhood Education, 1964, 41, 195-198.
- Murray, L. J. Studies of economically deprived elementary children in southern Illinois, A summary of four doctoral dissertations. Carbondale, Illinois: Southern Illinois University, College of Education, 1966, ERIC ED 021 886.
- Popham, J. W. The Instructional Objectives Exchange: New support for criterion - referenced instruction. Phi Delta Kappan, 1970, 52, 174-175.
- Purkey, W. W. Self concept and school achievement. Englewood Cliffs: Prentice-Hall, Inc., 1970.
- Raina, T. N., and Raina, M. K. Perception of teacher-educators in India about the ideal pupil. The Journal of Educational Research, 1971, 64, 303-306.

- Randolph, N., and Howe, W. Self enhancing education: A program to motivate learners. Palo Alto, California: Sanford Press, 1966.
- Rosen, S., Levinger, G., and Lippitt, R. Desired change in self and others as a function of resource ownership. Human Relations, 1960, 13, 187-192.
- Rosenthal, R., and Jacobson, L. Teacher expectations for the disadvantaged. Scientific American, 1968a, 218, 19-23.
- Rosenthal, R., and Jacobson, L. Pygmalion in the classroom: Teacher expectation and pupils' intellectual development. New York: Holt, Rinehart and Winston, Inc., 1968b.
- Russell, D. H. What does research say about self evaluation? Journal of Educational Research, 1953, 46, 561-571.
- Schwartz, M. E. The effect of teacher approval on the self concept and achievement of fourth, fifth and sixth-grade children: Case studies of seven children and seven teachers. Dissertation Abstracts, 1967, 28, 523f.
- Sears, P. S. The effect of classroom conditions on the strength of achievement motive and work output of elementary school children. Stanford: Stanford University, 1963, ERIC ED 011 136.
- Shaw, M. C., Edison, K., and Bell, H. The self-concepts of bright underachieving high-school students as revealed by an adjective checklist. Personnel and Guidance Journal, 1960, 39, 193-196.
- Soares, A. T., and Soares, L. M. Self-perceptions of culturally disadvantaged children. American Educational Research Journal, 1969, 6, 31-45.
- Staines, J. W. Self-picture as a factor in the classroom. British Journal of Educational Psychology, 1956, 28, 97-111.
- Tatsuoka, M. M. Multivariate analysis: Techniques for educational and psychological research. New York: John Wiley and Sons, Inc., 1971.
- Thurstone, L. L. Attitudes can be measured. Attitude Measurement. Edited by Gene F. Summers. Chicago: Rand McNally and Company, 1970.
- Torrance, E. P. The creative personality and the ideal pupil. Teachers College Record, 1963, 65, 220-226.
- Torrance, E. P. Rewarding creative behavior. Englewood Cliffs: Prentice-Hall, Inc., 1965.

- Torrance, E. P. Understanding the fourth grade slump in creative thinking. Final report. Athens: Georgia University, 1967, ERIC ED 018 273.
- Torrance, E. P. Encouraging creativity in the classroom. Dubuque, Iowa: William C. Brown and Company, 1970.
- Usitalo, R. J. Elementary guidance and counseling--A progress report of the activities of a laboratory. Olympia, Washington: Olympia School District, 1967, ERIC ED 018 822.
- Veldman, D. J. Fortran programming for the behavioral sciences. New York: Holt, Rinehart and Winston, 1967.
- Videbeck, R. Self-conception and the reaction of others. Sociometry, 1960, 23, 351-359.
- Walsh, A. M. Self-concepts of bright boys with learning difficulties. New York: Bureau of Publications, Teachers College, Columbia University, 1956.
- Williams, J. D., et al. Human awareness through self enhancing education. Report to the Grand Forks Public School District, Grand Forks, North Dakota, August, 1972. Grand Forks, North Dakota: Grand Forks Public Schools.
- Wylie, R. C. The self-concept: A critical survey of pertinent research literature. Lincoln, Nebraska: University of Nebraska Press, 1961.