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ABSTRACT

It was hypothesized that providing appraisal data to students would influence their knowledge of abilities, and thereby facilitate achievement test performance. The teacher would also have a greater awareness of student talents and would facilitate student performance on tests. The sample consisted of a random sampling of seventh grade students. Necessary data from test records were placed in interpretable form for feedback to students and teachers. Treatment groups were designated according to the recipient of appraisal data and were: Teachers Only, Students Only, Students and Teachers, and Control. The study employed a pretest-posttest control group experiemental design and utilized an analysis of covariance technique. Results suggest that providing students and teachers with appraisal information has little effect upon test scores, while providing such information to teachers alone tends to have an inimical effect on student test scores. (Author/CJ)

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AN ANALYSIS OF THE EFFECTS OF COMMUNICATING STUDENT APPRAISAL DATA TO STUDENTS AND TEACHERS

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U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education
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A STUDY TO DETERMINE THE EFFECT ON ACHIEVEMENT TEST RESULTS OF COMMUNICATING LOCALLY-DERIVED STUDENT APPRAISAL INFORMATION TO EIGHTH GRADE STUDENTS AND THEIR TEACHERS

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SUMMARY

A STUDY TO DETERMINE THE EFFECT ON ACHIEVEMENT TEST RESULTS OF COMMUNICATING LOCALLY-DERIVED STUDENT APPRAISAL INFORMATION TO EIGHTH GRADE STUDENTS AND THEIR TEACHERS.

By - Dudley, Gerald O,

South Bend Community School Corporation, Indiana

Project No. 8-E-145 Grant No. OEG 5-9-245145-0010 (010)

This field experiment investigated the effects upon eighth grade students' standardized achievement test scores as a result of communicating locally-derived student appraisal information to the students and their teachers. The theoretical rationale for this research speculates most students do not achieve commensurate with their ability, the major limitation being the learner's self-concept of his ability to achieve. This self-concept may have developed from a lack of appropriate information as well as from inimical feedback from significant others.

It was hypothesized that providing appraisal data to students would influence the students' knowledge of their abilities and and facilitate achievement test performance. The teacher, as an appraisal data recipient, would have an augmented awareness of student talents and would facilitate student performance on academic achievement tests.

The following null hypotheses were formulated:

1. At the conclusion of the study experimental subjects will not differ significantly from control subjects on achievement test scores.
2. At the conclusion of the study, no significant difference will exist in achievement test scores between and among experimental subjects classified by treatments a) their teachers only received appraisal data, b) students only received appraisal data, c) both students and teachers received appraisal data, and d) control subjects (no data feedback).
3. At the conclusion of the study, no significant difference will exist in achievement test scores between and among experimental students classified by factor levels a) mathematics, b) science, c) social studies, and d) reading achievement test results.

The sample resulted from a random selection of sixteen classrooms of students identified at the seventh grade level from a population of over four hundred academic classes in the South Bend (Indiana) schools. Data from these students' records, test results,

and teacher reports were placed in interpretable form for feedback to select students and their teachers during the students' eighth grade. The identified sample was divided into thirty-two sub classes and randomly assigned to four groups for differing treatments. These groups were designated according to the recipient of the appraisal data and were: Teachers Only, Students Only, Students and Teachers, and Control. Printed materials and school counselor interpretation provided the means for data communication to select students and their teachers.

The study employed a pre test - post test control group experimental design and utilized an analysis of covariance technique. The covariants used in the analysis were the ability and achievement pre-testsresults and the criterion measure was post-test achievement results, all in standard score (T) form.

The experimental results support the following conclusions: 1. Providing students and their teachers with student appraisal information has little, if any, effect upon students' achievement test scores. 2. Providing student appraisal information to teachers alone seems to have an inimical effect on the functioning of students on achievement tests. 3. It is less effective to provide student appraisal information to teachers alone than it is to provide this same information to both teachers and students. In addition to these major findings, the results showed that providing student appraisal information to students alone from the economic disadvantaged areas seems to be inimical to their functioning on achievement tests.

CHAPTER I

INTRODUCTION

STATEMENT OF THE PROBLEM

Educators have long been interested in and concerned about ways to improve the academic functioning of students. But all too often, their attention has been concentrated upon students who exhibited a capacity and a willingness to do good scholastic work while remaining students have been neglected or ignored.

A technological society depends upon an ever-increasing supply of highly educated people. Some charge that this demand for talent and its fulfillment are influencing factors in the creation of a society of haves and have-nots; privileged and underprivileged. Presumably, the demand for highly skilled workers means that a relatively greater proportion of the population will stay longer in school in the future. Consequently educators will work, not just with the intellectually capable youth, but with those often labeled "average" and with handicapped children as well.

A recent Office of Education publication (1969, p. 25) reported that if the trend in school holding power continues, 78 per cent of the students entering the fifth grade will continue to high school graduation in 1975. By way of comparison, the 1958 school holding power was estimated to be 58 per cent. Since a larger proportion of youth graduate, it can be estimated that more of those with average and below average measured scholastic aptitude will remain in school. One large-scale longitudinal talent study (Flanagan, 1965) has reported that:

> On the basis of present data, however, it appears reasonable to expect that a large fraction of our high school graduates may be found in the top 10 per cent with respect to the suitability of their pattern of aptitudes for at least one of the two hundred or so important career opportunities available to young people.

However, Flanagan adds that, "Unfortunately, the preliminary indications are that the full potential of a large portion of the nation's young people will not be developed."

Thus, not only is a larger proportion of youth expected to remain in high school and graduate, but the expectation is that these students have abilities which must be nurtured and developed.

Presently the challenge is to find ways of working with those whose abilities have heretofore been ignored. Certainly today's schools must develop more fully a broader range of talent than they have in the past.

Impediments to the development and use of learning ability are many and varied. Brookover (1962, p. 2) states that:

> Although we recognize that innate factors may set limits to learning ability, we also recognize that few people achieve anywhere near this level set by innate capacity. We, therefore, have investigated one factor that may functionally limit the learning of many students and thereby prevent them from working at their maximum level. This is the student's self-concept of his ability as a school learner.

That each student's school achievement may be limited by his concept of his own ability is a key concept. Interactionist theory suggests that the following considerations may relate to classroom learning: 1. People behave and learn to behave in ways that appear appropriate to them. Conversely, each person doesn't learn to behave in ways that are inappropriate to him. 2. Appropriateness of behavior is defined by each person through internalizing the expectations of significant others. Thus the formation of the self-image. 3. The limits of learning abilities for each person are determined by his self-conception, self-image, or self-knowledge. 4. The individual learns what he believes significant others expect him to learn (Brookover, 1969).

When a child is very young there is little question that he will learn the language into which he is born and will talk relatively quickly. He will also grasp quickly the social mores and learn to respond in ways deemed acceptable by those in his environment. There appears to be no evidence to demonstrate that the mechanics of learning employed by a young child are any different from those used later in classroom settings. The difference, according to proponents of interactionist theory (Mead, 1934, Rose, 1962), is that current educational systems do not expect the "masses" to succeed. The student in this setting learns only what he perceives he is able to learn, that perception being gained by interacting with significant others both within and without the educational system.

Brookover (1959, p. 87) suggests that a change in conceptualizing the learning process is necessary if schools are to become more successful. According to him:

> If the educational system recognizes and applies a social conception of learning to the school situation as we have long since done to other kinds of learning endeavors, a high level of educational achievement throughout the society may be realized.

Kehas (1967) has also proposed that a redefinition of education is in order. One aspect of the redefinition is that the personal development of individuals would become a primary concern of schools. He defines personal development with these words.

> The notion of personal development is concerned with self-knowledge, with the continuing development of intelligence about self through systematic personal inquiry (as distinguished, perhaps from scientific inquiry or social inquiry). It is concerned with that aspect of human experiencing which has been variously characterized as self concept system, personal construct system, ego identity, self-evaluation, self attitudes, self-actualization (p.7).

A major goal of many counselors is client self-understanding. Samler (in Saltzman and Peters, 1967) indicates that self-understanding is a key aspect in mental health and a pre-condition for making mature and responsible choices. Peters and Shertzer (1963) stress that the development of the self and personal growth are appropriate guidance outcomes of both vocational and educational decision-making endeavors. According to Flanagan (1962), the guidance process is operative when there is an interpretation of the many samples of a student's talents so that he may get a clear picture of himself in order to develop his highest potentials. In this same regard, Dressel (1964) asserts that the fullest development of each person requires recognition of this essential individuality, and it also requires some rational appraisal, by himself and by others, of the significance and potentiality of this individuality.

The school counselor's role not only involves establishing counseling relationships with individuals and groups of students, but includes consultation with teachers (APGA, 1964, Wrenn, 1962). Shaw (1968, p. 52) believes that one way school counselors can be helpful to teachers is through interpreting student data. Many guidance authorities have long suggested that interpreting student appraisal data to both students and teachers is an appropriate and necessary counselor function. This process may produce changes in the teacher's concept of a student. The resulting teacher behavior may effect change in a student's concept of his talents, which in turn, leads to improved academic functioning. The counselor, therefore, is in a position to help the student to change his concept of his talents, which in turn, leads to improved academic functioning. The counselor, therefore, is in a position to help the student to change his concept of his abilities directly (through individual and group relationships) and indirectly (through his teacher).

Although there are many theories for utilizing data about students, the decision-making model proposed by Katz (1966) is particularly attractive for the secondary school. Essentially, he views counseling as intervention in the decision making process. In order to make appropriate choices the decision maker needs adequate information, and he needs "an effective strategy for analyzing, organizing, and synthesizing that formation" (Clark, Gelatt, and

Levine, 1965, p. 41). Various decisional approaches being tried in research projects at present seem to deal with "cognition--not only about courses of action, but about self--seems central in all of them" (Katz, 1969, p. 138).

Peterson (1968, p. 1) points out:

> An essential ingredient of a guidance program that involves decision making is the collection and utilization of relevant and realistic information. Specific information that is personally meaningful needs to be provided and organized in a functional way so that its relevance to individual decision making is apparent.

A modern system for collecting, evaluating, and presenting relevant student data must take advantage of available computer know-how and perhaps extend these techniques beyond their present capabilities. This attitude is reflected by Cooley and Hummel (1969, p. 260-269) when they say that:

> This new emphasis on systems approaches and the accompanying concern for research and development is a healthy one. This approach will probably produce more powerful procedures for assisting individuals to appraise their life prospects and to formulate relevant plans. It is also more likely that the systems approach will provoke more critical analysis of and innovations in guidance practices than have been produced by traditional research.

PURPOSE OF THE STUDY

From the foregoing discussion, certain logical conclusions seem evident. The typical student in future public educational institutions will be more apt than his contemporary counterpart to continue on to high school graduation. Presumably a wider range of talent will be present in the classrooms of the nation's schools. Most students do not achieve commensurate with their measured abilities. A major limitation to achievement may be the learner's self-concept of his ability to do well scholastically. Many have theorized that this self-concept originates from a lack of appropriate information as well as from negative feedback from significant others in his environment.

The primary purpose of this investigation was to analyze the effects upon students' achievement test scores when relevant student appraisal data--measures of ability, achievement, and personality--are communicated to teachers and pupils. Classrooms of seventh grade students were selected, information gathered about them, and the data placed in interpretable form for feed-back to teachers and these same students in the fall semester when they became eighth grade students. A counselor was the agent for interpreting student appraisal data to both student and teacher. In addition, printed materials were provided to assist further in the data interpretation.

It was hypothesized that this technique will influence students' knowledge of their abilities and result in better performance in academic achievement. The teacher, likewise, will become more aware of the talents of particular students and will be more helpful, more concerned, and more aware of ways to help students increase their academic achievement.

OBJECTIVES AND HYPOTHESES OF THE RESEARCH

The investigator seeks to analyze the effect upon students' achievement test scores when students and teachers are provided with personal data about student ability, achievement, and personality.

Specific objectives include:

1. To investigate the effects upon students' standardized achievement test scores as a result of communicating student appraisal information to eighth grade students and their teachers.

2. To investigate the effects upon certain students' achievement test scores as a result of communicating student appraisal data to teachers only, to students only, and to both teachers and students.

So that a statistical measure of the effectiveness of the activities proposed in this study may be made, the following null hypotheses were formulated:

1. At the conclusion of the study, experimental subjects will not differ significantly from control subjects on standardized achievement test scores.

2. At the end of the experimental period, no statistically significant difference will exist in standardized achievement test scores between and among experimental subjects classified by treatments a) their teachers only received appraisal data, b) students only received appraisal data, c) both students and teachers received appraisal data, and d) control subjects (who did not receive data feedback).

3. At the end of the experimental period, no statistically significant difference will exist in standardized achievement test scores between and among experimental students classified by factor levels a) reading achievement, b) mathematics achievement, c) social studies achievement, and d) science achievement test results.

Post analysis of the data will be conducted using the following null hypotheses with the .05 level of significance specified:

At the end of the period of experimentation:

4. No difference will exist between the correlation of non-academic (personality) traits with measures of academic ability and the correlation of these same traits with measures of achievement.

5. No difference will exist in standardized achievement test results between students to whom data were communicated close to post-testing and students to whom data were communicated close to pre-testing.

6. No difference will exist in standardized achievement test results between female and male students.

7. No difference will exist in standardized achievement test results between relative months of student birth dates.

8. No difference will exist in standardized achievement test results between black and white students.

9. No difference will exist in standardized achievement test results between students living in residence areas classified as eligible for TITLE I, Elementary and Secondary Education Act assistance (Public Law 89-10) and those residing outside these areas (census tracts).

LIMITATIONS

Because this study was conducted in a public educational institution certain limitations were both inherent and imposed. One inherent limitation that may have some bearing on the outcome is that students in the control or comparison group have access to a counselor. It is reasonable to expect that some of these students may receive help which could well result in improving their self-knowledge. The teacher, likewise, may be stimulated to seek out appraisal data from the records of students in either the control group or treatment group in which the student only is to receive prepared appraisal information.

How teachers use the information supplied them through the project may not be known. It was assumed that the information was in addition to whatever the teacher normally had at her command when working with these students. To decrease halo effects, no announcement was made that an experiment was being conducted. The specific criterion under investigation was not discussed with either counselors, teachers, or administrators.

Although a measure of reliability of the instrument used by teachers to assess character ratings has been determined in a separate study with high school teachers, the reliability of character ratings by junior high school teachers is not known. It was assumed that the reliability of their character ratings (personality) was similar to that of teachers in secondary school settings.

A delimitation imposed on this research is that appraisal information was not presented directly to select parents of students involved in the study. Some reported research has demonstrated that these significant adults may effect changes of the nature the investigator is attempting. However, it may be noted that the parents of students who were assigned to treatment groups receiving personal data may become familiar with the information because students take reports home. There was no attempt to control this parental influence variable in the study, rather students were urged to take the information home for parental perusal and discussion.

SIGNIFICANCE

This investigation should yield specific results about the effects of communicating locally-derived student appraisal information to students and teachers at the eighth grade level in school systems comparable to the one conducting the study. At a time when there is national concern for the education gap that exists between graduates and school leavers, techniques for preserving and encouraging academic success should be helpful.

School counselors need assistance in identifying methods that bridge the gap between the collecting student appraisal data and the feedback of results to both students and teachers. The school district in which the investigation was conducted benefits by retaining locally-derived information workbooks and computer programs as well as formats for preparing and printing student appraisal information.

DEFINITION OF TERMS

Certain concepts utilized in this investigation have been defined as follows:

1. Locally derived data are based upon the cumulative performance of students who have attained both seventh and eighth grade promotion in the school system in which the study was conducted. These data were taken from the records of these students and were up-to-date.

2. Academic student appraisal information was defined as teacher-given course grades as well as results of standardized tests of ability and achievement. The Cooperative School and College Ability Test II, and the Cooperative Sequential Tests of Educational Progress were used as the test of ability and achievement, respectively.

3. Non-academic student appraisal information was the ratings of students by knowledgeable seventh grade subject teachers. These ratings are recorded observations of the individual students' initiative, leadership, industry, emotional stability,

motivation, common sense and judgment, dependability and responsibility, consideration for others, and integrity and honesty.

4. Experience tables were probability tables based upon seventh and eighth grade end-of-year academic grade average. These experience tables report probabilities in terms of chances out of ten.

CHAPTER II

REVIEW OF RELATED LITERATURE

Reported research spanning the immediate past decade that deals directly with the process of communicating student appraisal information is summarized in the triennial April issues of Review of Educational Research. In his (1963) report, Goldman wrote that although several related studies appeared since 1960, little research had been reported which was directly relevant to this process. In their 1966 review, Carnes and Doughtie concluded that some improvement in the related research had taken place, especially with regard to research approach and methodology. However, the 1969 issue of the same publication was reorganized in its content and contained no review relating directly to the appraisal function in education. But the issue did report studies which investigated the communication process.

Antecedents to this study have been located in the literature of studies that: (1) investigated some categorical relationships with self-knowledge; (2) dealt with influencing students' self-knowledge; and (3) surveyed feasible strategies for communicating appraisal information. This review includes some investigations of academic achievement particularly if they sought to relate achievement to self-knowledge.

CORRELATES OF SELF-KNOWLEDGE

Surveys and studies directed toward the discovery of correlates with self-knowledge, self-concept or self-image have been reported in three somewhat loosely analogous groups. The first group consisted of studies that relate student self reports to measures of academic achievement in school settings. A second group of studies sought to describe the relationship of academic achievement to some non-intellective characteristics. The third group of studies investigated the relationship of student self-knowledge with influences present in his society or culture.

Among Canadian students, Fink (1958) tested hypotheses that an adequate self-concept is related to high academic achievement and an inadequate self-concept is related to low school achievement. His results supported the stated hypotheses at the one per cent level for boys but at only the ten per cent level for girls.

Shaw, Edson, and Bell (1960) sought to determine how the under-achiever and achiever compared on self-perception. Although they were not able to demonstrate that differences in self-concept were the result or cause of under-achievement, they reported that certain

differences do exist. The self-reports of underachieving males contained more negative responses than those for achieving males. Female underachievers tended to be ambivalent regarding their feelings toward themselves. In a later investigation which used more objective measures and a tighter statistical procedure, Shaw and Alves (1964) reported results consistent with earlier findings and pointed to a direct association between negative self-attitudes and academic underachievement, when ability levels were held constant.

Brookover, Shailer, and Paterson (1964) reported that among seventh grade students: 1. A significant positive relationship exists between self-concept of ability and grade point average, when ability levels are controlled; 2. A relationship exists between the self concepts of ability in arithmetic, English, social studies, and science and achievement in these academic achievement areas; 3. Self-concept was significantly and positively related to the perceived evaluation of significant others.

The results of studies by Shaw and his associates were similar to those reported by Dyson (1965). He attempted to determine the effect, on self-reports, of grouping (hetrogeneous vs. homogeneous with regard to ability and achievement) on junior high school students. Positive self concepts were associated with higher report card grades according to Dyson, while those who earned poor report card grades had significantly less positive self concepts. "Grouping" alone appeared to have little relationship with self concepts but results did demonstrate that the 567 boys and girls in the study had patterns of self acceptance that were similar to their academic self-concepts.

Over a period of two years, Bowman (1964) sought to determine if relationships existed bewteen the self-concepts of sixth and eighth grade students and such factors as their achievement, intelligence, and interest. One conclusion reported was that the students in the study appeared to improve in self-concept over the period of the study without any special attempts being made to change their self image. Pearson product moment correlations, at the eighth grade level, between self concept and both intelligence and achievement were positive and significant. At the sixth grade level the results were in the positive direction but correlations did not reach the specified significance level.

The high, the average, and the low achieving junior high school student was the subject of a study by Miller (1965). He employed a Q-sort technique to ascertain the students' "real" self, "student" self. "ideal" self, and "teacher perceived" selves. The congruence between and among all sets of descriptions was assessed through correlation coefficients. The results of this study suggest that a positive and significant relationship exists between measured "real" and "student" self concepts. High achievers of high ability tended to show consistency and similarity in their self descriptions, satisfaction and positive regard for their "student" self concept and higher congruence between self and inferred descriptions. Further analysis revealed that both the average and high achiever groups

were successful and school oriented while low achievers tended to value friendship more highly than scholarship. Evidence was presented in this study (as with the others reported) that self esteem and self regard were related to achievement in school. Nash (1964) has also explored the relationship between the self perceptions of seventh and eighth grade students and their scholastic achievement (adjusted for differences in tested ability). No significant relationship was reported. However, Brookover, Paterson, and Shailer (1962) report that "It seems clear that self-concept of ability functions independent of measured intelligence in predicting school achievement (p. 75)."

Sopis (1966) was able to determine the existence of a variable called "self image" among pupils in grades two through five. According to her, this variable related to reading achievement such that students with high "self image as a reader" had better reading achievement than students with average or low self images as readers.

Achievement motivation has been examined by Atkinson and Feather (1966, p. 368-9). They identify patterns of behavior that might be consistently expected from individuals on opposite ends of an achievement motivation continuum. The "achievement oriented person" is one who is attracted to activities which require the successful use of skill, but in which the level of difficulty is intermediate--as contrasted with easier and safer ventures or more difficult and speculative ones. In contrast the "failure threatened personality" is common to one whose motive to avoid failure greatly exceeds the motive to achieve. These characteristics were the central idea of a study by Farquhar (1963) who sought to determine the relationships between motivation and academic achievement. He reported that eleventh grade students (particularly boys) with high self concept tend to have high academic productivity while low self concept students produced conversely. Although the results did not explain all sources of variation, extremes of motivation factors appeared positively related to over- and under-achievement. Martire's investigation (1955-56) of male college volunteers revealed that a measured relationship existed between self concept and achievement motivation. Those students whose discrepencies in self and self-ideal ratings were greatest were the ones who consistently earned the highest achievement motivation scores. Babcock (1967) states that "--self-concept is a major factor in motivation and, therefore, in achievement."

These and other investigations reveal that differences may be found in self reports between students who achieve well in school and those who do not. An unknown factor is whether self report assessing techniques are loaded in favor of students who are achievers, but some suspect this to be true. Another thread of commonality running through the outcomes of these investigations is that the relationship of the self concept to achievement may be different with regard to the sex of the student. However, the difference appears to be present no matter what the level of education.

Another body of literature related to the present study is that

which sought to determine the relationships of achievement with other non-intellective student characteristics. Tyler (1966) concluded from a literature review that: (1) the degree to which the student is able to handle his anxiety; (2) the value a student places upon his own worth; (3) the ability to conform to authority demands; (4) acceptance by peers; (5) a minimum of conflict with the independence-dependence syndrome; (6) activities centered around academic interests; and (7) realism of goals were all positively related to achievement among high school students.

Finger and Schlesser (1965) and Finger and Silverman (1966) reported that the factor analytic findings of their studies demonstrated that non-academic predictors of academic success among junior high school students correlated highly with achievement test scores but had low correlation with standardized measures of intelligence. In their second study they suggested that

> The junior high school years would seem to be an educational period of disquieting discontinuity for many students, a period of painful crises and important consequences. This perspective would suggest that if students are to survive these periods of crises the demands made of them by the school must be consistent with their abilities and capacities, both intellectual and non-intellectual.

Gardner (1960) reported that character trait ratings of high school students had a high correlation with the college grades they later received. The traits and their individual predictive correlations were identified as:

Reliability - .657	Initiative - .657
Industry - .685	Efficiency - .712
Cooperation - .587	Accuracy - .740

Hudson (1960) suggested that the results Gardner obtained from the rating scale indicates that these traits possess value for assessing the academic potential of high school students.

When he reviewed the literature on the non-intellective factors which relate to academic achievement among high school students, Gough (1949) reported relationships with such factors as introversion, dominance, self-sufficiency, good motivation, liberal social attitudes and lack of maladjustment. Among the Minnesota Multiphasic Personality Inventory test items that demonstrated some relationship to underachievement were indicators of lack of emotional tension, immaturity, social extroversion, disinclination to admit personal problems, and a tendency to see others in a favorable light.

Middleton and Guthrie (1959) compared the results of a personality questionnaire given to high and low achieving groups of college students. The achievement of high grades appeared to be motivated by drives for power, resentment, dependence, social acceptance, and aggression.

Among the factors associated with low achievement (college GPA) were pleasure seeking, extroversion, and denial of normal shortcomings.

Capretta (1963) studied the non-cognative characteristics of honors program candidates and stated that not only do these factors seem to play some role in individual success in the intellectually oriented program, but that they may constitute the personality differences between superior students who accepted invitations to join such programs and those who do not choose to compete. Thus the decision to pursue a course may be effected by the non-intellective characteristics a student posesses.

Goal setting behavior and related personality variables among female college students in a course in educational psychology was investigated by Mitchell (1959). The author reported that self-accepting students consistently over-estimated their grades while self-rejectants had a significantly smaller discrepancy between previous grades and present level of aspiration. The conclusions were that the subjects with negative self concepts were conservative and cautious in goal setting behavior while those with positive self concepts were more liberal in the estimation of expected grades, even though they tended not to achieve them.

Holland and Richards (1966) reported that the results of a very large scale investigation among high school students strongly suggest that academic and non-academic factors are relatively independent dimensions of talent. They stress that since they are independent, measures of other-than academic talent as well as measures of originality need to be developed. Their results make it clear that academic potential and achievement have little relationship to some kinds of non-academic potential and socially important performance.

There are some important generatizations that may be gained from research seeking relationship between self-knowledge and cultural or societal influences, although the magnitude of research that has been conducted in this area is small in comparison to studies relating academic achievement, self-knowledge and non-intellective student characteristics. When junior high school children were asked to make estimates of their ability to do school work, Wylie (1963) found several correlates related to cultural learning. Negro subjects in the study made more modest estimates of their ability than did white children. Subjects from lower socioeconomic level homes made more modest estimates of ability than did those from higher socioeconomic homes. The researcher suggested these self evaluations of ability were developed as a function of both race and economic factors.

Coleman (1940) compared high and low socioeconomic groups of junior high school students from a national sample with normative groups and each with the other. He concluded that there was a relationship between measures of socioeconomic status and achievement in school courses as well as with intelligence measures.

Mayeski, Tabler, Weinfeld, Beston Jr., and Proshek (1968) conducted

correlational and regression analyses on data from a national sample of ninth grade students. Their results underscore the importance of socioeconomic status to achievement. The lower socioeconomic home is generally considered as having a negative influence upon educational achievement, but Nason (1958) reports that low achievement among pupils of superior intelligence is related to a lack of positive influences.

Muma (1965) has emphasized the importance of peer relationships upon academic performance. Some 3,917 junior and senior high school students from seven different schools were used to measure peer choice by sociometric techniques. The final report card grades showed a significant relationship to the manner in which students were evaluated by their peers.

From the foregoing research reports, certain pertinent ideas were drawn upon in conducting the research undertaken in this report. First of all, there appears to be differences in self concept between low and high achievers. This knowledge adds support for using an achievement measure as a criterion instrument. Second, since the self concept of male and female students appears different, a separate analysis by sex seems justified. Third, since the results of several studies underscore the importance of a measure of intelligence as a means to equate academic achievement, the research undertaken will utilize such a measure. Fourth, character trait ratings appeared as a predictor of academic success in some studies. A rating of character traits will be utilized as a supplement to academic information. Separate analysis are also suggested and will be conducted using the variables of race and levels of socioeconomic status.

FACTORS THAT INFLUENCE LEARNERS' SELF-KNOLWEDGE

In this section attention will be given to certain representative research reports that investigated factors that influence and students' self-knowledge. Counseling has frequently been recommended as a logical means of treating under-achieving students, but research outcomes in the area do not provide an optimistic outlook. Hamachek (1968) reported that small group and individual counseling with low-achieving junior high school students had a negative effect on grades, self-concepts, and the satisfaction of staying in school. Calhoun (1956) also used a junior high school population for investigating the effects of "advisory" counseling upon underachievers. While the experimental group had gains over the control group, this difference did not reach significance levels. Sheriffs (1949) reported that counselor-student interviews resulted in improved achievement measure scores. Adult guidance center clients rated themselves on self-knowledge immediately before, after, and one month after receiving "vocational counseling" in a study by Johnson (1953). He concluded that counseling contributed significantly to client self-knowledge and that these increases in accuracy and certainty of self-knowledge were maintained over a one month period. Jackson (1966), McGowan (1968) and Benson and Bocher (1967) experimented with counseling low achieving high school students and reported

significant improvement took place in their academic performance as well as other school behaviors. Further research seems necessary to determine why positive and negative effects in both self-concept and academic achievement result from the effects of counseling.

At the college level, Wright (1963) reported that test interpretation interviews produced significant gains in self-understanding. Individual and group counseling techniques were compared with a control group, and both methods contributed to a student's better understanding of himself. Lassus (1956) found the same results when working with high school students and suggested that group interpretation be followed by individual interpretation sessions. Lister and Olson (1965) concluded that student participation in analyzing the test results was superior to information-giving interviews at the junior high and high school levels. An orientation to testing appeared to be related to an increased motivation to learn from test results at the junior high school but not at the high school level. Brown (1965-66) studied the ability of "good and poor adjustment" (personality) groups to accept objective data regarding their scholastic abilities. While the investigator was unable to find a significant relationship between the clients' personal adjustment and his ability to accept personal scholastic ability data, he did report that those receiving test data through interpretation had significantly more accurate self-ratings than did a control group. Further, this accuracy persisted over a thirty day followup period.

Hills (1965) reported that while the receipt of test information failed to bring about positive changes in the self-perceptions of college students, the receipt of information not congruent with client expectations seemed to have a detrimental effect on self-perceptions. He indicated that the esteem held by the client for the counselor may effect the magnitude of negative self-perceptions.

Benjamins (1950) experimented with the release of false test reports to determine the changes in self-concept and test results that would be produced. He found that those students who changed their self-rankings on the basis of the false reports usually had intelligence test score changes in the same direction when later given an alternate form of the intelligence measure. A common conclusion from test interpretation studies is that self-understanding by students involved in the interpretation was superior to control group behavior when those controls did not have the benefit of interpretation sessions.

Another group of studies have investigated the influence that significant others have upon students' self-knowledge and achievement. Two studies point to the influence that parents have on the motivation and aspirations of children. Rosen and D'Andrade (1959) examined data of child-parent interaction and concluded that motivation to achieve resulted from parents' early training of the child by: (1) imposing standards of excellence; (2) assuring self reliance through training; and (3) employing sanctions to enforce appropriate behavior. The second study by Bell (1963), who held IQ and social class constant,

found that the aspirations of adolescents related to the aspirational motivation of their parents. In a study to determine the sources of influence of adolescent decisions, Solomen (1961) determined that the students' impulses and values (called internal influence sources) were more involved in adolescent decision making than are parents and peer groups (external influence sources). Admittedly "tighter" research techniques were badly needed.

Shaw and Rector (1968) reported that they could positively change such behavior as school grades, achievement test scores, frequency of school absences, tardiness, and discipline referrals through intervention with the parents of the affected students. They suggest that a model for the prevention of learning difficulties through environmental intervention is feasible.

Brookover and his associates (1965) concluded from a study involving the parents of junior and senior high school students, "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 (p. 100)." Erickson (1965), in a separate study, concluded that the academic expectations of the family play a major role in the academic performance of the student.

The influence teachers exert on the enhancement of student self-concept and therefore academic performance is somewhat difficult to determine from the variety of approaches, criterion, and results cited in the literature. Lytle (1968) concluded that while family background accounted for most of the achievement-related variables, teacher characteristics explained most of the differences in school factors (facilities, curriculum, and staff) which are related to achievement. He stated that this conclusion "represents a unifying thread in research in this field."

Anglin, McNamara and Riccio (1962) describe an approach used to change the behavior of teachers and students when the "classroom equilibrium" appears to be upset. Although the results were not reported in statistical terms, focusing on the normal child's developmental traits through teacher and student discussion was observed to be beneficial to both teacher and student.

A change in the self-concept of students through the influence of teachers and peers was the subject of a study by Bixler (1966). She reported that self-concepts fluxuated over the one school year period, but that they did not change significantly at the sixth grade level of the study.

Subjective information, according to Hopke (1961), was rated by junior high school teachers as quite helpful in understanding pupils. Teachers who normally made little use of guidance records were provided the pupil information they wanted made available. Those teachers who previously made use of guidance records found no advantage to the procedure.

Bradt and Duncan (1951) reported that instructor-student interviews resulted in improvement in the course grades of students. Whether this was the cause or effect was not clearly reported.

Hypothesizing that teacher awareness of background information about students would improve academic performance and improved self feelings, Peterson, Smith, and Drisher (1963) conducted a study with high-potential low-achieving high school students. No significant result was found and the authors concluded that it may be more feasible to change the classroom than to change the student.

The research reported by Hoyt (1955) is similar in its focus to the previous research. He investigated the effects of teacher knowledge of pupil characteristics and reported that this resulted in significant improvement in student attitude toward the experimental teachers.

Ojeman and Wilkinson (1939) reported significant grade point increases occurred with ninth grade students whose personality records, environmental data, and parent interviews were summarized and interpreted to teachers in the experiment. In addition, attitude measures indicated a happier attitude toward school and school work by the experimental group. In a similar study, Hayes (1966) reported no significant difference between achievement and attitudinal means among tenth grade students when their teachers received feedback about their teaching from students, trained observers or control groups.

Sweet (1966) measured and reported the effect on student achievement of different types of written comments to ninth grade English classes. Attitude changes were also investigated. The reported results demonstrated that feedback was effective in positively changing scholastic performance and attitudes toward English. The authors suggest that caution be exercised in generalizing the results to other situations.

Vaughan (1965) investigated (1) the relationships between and among a person's self-conception, perception of others' evaluations of him, and others' evaluations of him; (2) the conditions under which the magnitude of these relationships vary; and (3) the relationship between one's self conception and his behavior in college - level graduate seminars. He reported that the self-concept was positively related to perceived and actual evaluations by others and the instructor. He concluded, as have others whose work has been cited in this section, that "self conception is related to responses of others in inter-active situations and functions to influence the individuals behavior."

STRATEGIES FOR COMMUNICATING APPRAISAL INFORMATION

Certain strategies for communicating appraisal information have shown promise when utilized in programs or studies related to this one. The evidence from studies conducted at Stanford (Krumboltz, 1965) indicates that behavioral counseling techniques were effective

for promoting career planning, improving "test-wiseness", increasing social participation, increasing deliberating and decision behavior, promoting acceptance of test results, and modifying unrealistic decisions.

San Diego Schools (1960) and Kinling (1960) report that comparisons of achievement and intelligence test results for individual pupils can be made easily by data processing equipment that profiles the related test performance for teacher use. Wilkes (1966) has prepared an IBM Type III program for computer use that will provide the above profile (and other interpretations) from raw test data. Burr (1969) reported that more effective use of results will occur by using profiles. Teachers and parents reported favorably that stanine scores were found to be meaningful when interpreting test results (Dorset, 1959).

Harris and Dole (1960) concluded that use of a prediction table approach can be helpful with college-entering high school students to predict college acceptance. Eells (1961) developed and utilized expectancy charts with incoming freshman and concluded that counselors and students believed that the charts were an understandable method of presenting what the student is up against when he enters a university. Kacykowski (1959) found expectancy tables were useful in making test results more meaningful in terms of the local situation. An expectancy table approach was found useful by the Educational Testing Service (1965) in their Indiana Prediction Study. While these reports were not experimentally based, they represent some expert opinion and give direction for the preparation of data for use by students and teachers.

Gelatt and Clarke (1967) report that "Experimental evidence from a variety of sources provides strong empirical support for the thesis that subjective probability estimates are an integral part of the educational-vocational decision process (p. 340)." Clarke and Gelatt (1967) demonstrated that it is possible to predict college success as early as the ninth grade and that these data can be presented meaningfully by employing experience tables.

In two related experiments (Yarboff, 1964), results demonstrated that: (a) using local data was more effective in teaching decision-making than general data with students at all ability levels; (b) students who received local data remembered and used this information when making choices in a way not characteristic of those who received general data; and (c) local data appeared to influence planning in a more realistic direction.

In an experiment designed to determine the effect of different types of printed materials on elementary students, Eaton (1966) reported that material which emphasized activity was positively related to gains in achievement test scores. A definite relationship existed between those learning materials which employed the greatest number of activities and favorable student attitudes.

CHAPTER III

METHODS AND PROCEDURES

RATIONALE

The previous review of related studies points up certain strategies and techniques which might be used in schools to improve both the self-knowledge and academic achievement of students. First, despite frequent recommendations, counseling has not been particularly useful in this endeavor. However, the interpretation of test and other appraisal information by counselors has been demonstrated to influence students' self-knowledge. Second, the results of related studies report that a positive relationship exists between student self-knowledge and academic achievement variables. Third, research results in the area of giving more student information to teachers have suggested an influence on the way the teacher reacts to students. Fourth, studies have shown that the manner in which significant others respond to students has an influence on a students' self-concept.

The techniques of providing the student and the teacher with appraisal information appear to be both appropriate and useful for the school counselor. This research is based upon that premise and evaluates the influence of these techniques for changing students' achievement test performance over a two-semester period.

This study was designed to investigate the effects of supplying both students and teachers with locally-derived student academic and non-academic information. Classrooms of seventh grade students in 19 South Bend junior high schools were selected at random for participation in the study. Student appraisal information was interpreted to the teachers and student members of the experimental groups. This approach was initiated at the start of the fall semester of the students' eighth grade and continued for two semesters.

The outcomes of the study were obtained through a comparison between and among the experimental and pre-identified non-treatment control groups of students. The criteria measures used in this experiment were standardized tests of academic achievement appropriate for this junior high school level.

SCHOOL SETTING AND SELECTION

South Bend is an urban, industrial community, located in Saint

Joseph County in north central Indiana. The 1960 census established its population at approximately 138,300. The classifications of the population ranges from high to low educational and income levels, skilled and unskilled laborers, farmers, and professionals from many nationalities. In this highly diversified area, approximately 34 per cent of those employed work in manufacturing occupations with about 66 per cent employed in non-manufacturing classifications. South Bend ranks fifth in Indiana in population, and based upon numerous marketing and research studies conducted there year after year, it is a typical cross section of America.

The student body of the school district reflects this diversity. There are approximately 38,000 public school students in attendance at the public elementary, junior high and high schools. Nearly 77 per cent of the students entering the ninth grade eventually graduate from high school. Of the graduates, approximately 42 per cent enter a college or university for post high school study while 13 per cent enter other types of formal training schools.

All students at the junior high school level (grades 7 and 8) move from class to class and teacher to teacher throughout each school day. Academic (basic subject) classes in English, mathematics, social studies, and science meet five days each week. All other classes meet on various systems of part-time schedules during the week.

The population that was included in this study was all possible basic subject classes of students at the seventh grade level which meet five periods each week. This population attends more than 400 academic classes each day in the 19 schools with junior high school programs.

Student characteristics across the schools show wide variability, with some classification categories being concentrated in certain schools. The socio-economic level of families included ranges from neighborhoods eligible for Title I, Elementary and Secondary Education Act (Public Law 89-10) funds to those areas in which the school patrons are primarily upper-middle class. The range of individual school enrollments is from 70 to 350 students in the seventh grade. Group scholastic ability test results range from a school average of stanine four to seven, based upon comparisons with national norms. Teacher experience in these schools ranged from no prior experience to over thirty years. There appeared to be a broad spectrum of students available in the schools from which the sample of classrooms was selected for this study.

The first phase of this project consisted of selecting both the schools and classrooms of students to participate in the study. The principal at each of the nineteen junior high schools was requested to nominate a seventh grade teacher and one of his classrooms of students. This initiated the student identification phase of the study. Because of the size of their respective student populations, three of the school principals were each asked to nominate two classrooms of students as a means of offsetting any inbalance that might occur

due to differences in the size of student bodies. This procedure gave positive identification to twenty-two classrooms in which a total of seven hundred students were members. It also assured that no school would have more than two student classrooms participating in the study and no student would be a member of more than one of the participating classes.

From this potential of 22 intact classes the sample of students used in this study was selected. In order to determine with some accuracy the sample size necessary for statistical significance, should it occur, a procedure outlined by Winer (1962, p. 104) was conducted. By knowing that the overall test of significance is to be made at the .05 level, and a power .90 is desired with respect to the computed $\emptyset' = .768$ (see appendix for computation), interpolation of the Pearson-Hartley tables of Constant Power for the test of Main Effects (Scheffe, 1960) suggested eight replications were necessary in each of the four treatments. Sixteen of the twenty-two classes were selected to participate in the study through a random assignment of classrooms to one of six achievement sub-tests (reading, mathematics, social studies, science, writing, or listening). Classrooms assigned to the writing and listening groups participated in the pre-testing, but not the experimental portion of the study.

SAMPLE SELECTION, IDENTIFICATION AND GROUP ASSIGNMENT

The second phase of the study consisted of pre-testing the selected students with a scholastic ability test as well as a standardized achievement test. The Cooperative School and College Ability Test, Series II was used as the measure of scholastic aptitude. Either the reading, mathematics, social studies, or science subtest of the Cooperative Sequential Tests of Educational Progress was used as a pre-achievement measure, with the assignment based on the procedure outlined above for classroom selection from the available population.

The pre-testing and individual student identification phase was conducted during the last two weeks in May, 1968. Alphabetically alternating members of each of the intact classes were then randomly assigned to one of two sub-classes to form the thirty-two units required for the experiment beginning in the fall of 1968, when these students werein the eighth grade.

In the fall the sample of sub-classes within each achievement level was randomly assigned to four groups for differing treatments. These groups were designated according to the recipient of the appraisal data. The groups were: teachers only, students only, students and teachers, and control.

GROUP I -- TEACHERS ONLY

Personal information as well as standardized test information about these students was distributed to their teachers. The teachers

were urged verbally and in writing to use the information as an aid to understanding the student and to help him improve the level of his scholastic performance.

GROUP II -- STUDENTS ONLY

The students in this group received appraisal information in workbook form through individual and group interpretation by a school counselor trained for the interpretation. Teachers did not receive prepared information about students in this treatment group.

GROUP III -- STUDENTS AND TEACHERS

Both students and teachers received appraisal information simultaneously, combining the approach used with groups I and II.

GROUP IV -- CONTROL

Members of this group were not identified to the teachers in the school. These students as well as those in the other experimental groups were not overtly made aware they were participating in an experiment.

These groupings were devised to assess the effects of different experimental treatments. It was assumed that the students assigned to groups I, II, and III would receive new and useful information and may also receive special help. Theoretically, the students in group IV received no special information or help and were considered no-treatment controls.

TABLE I

NUMBER OF STUDENTS ASSIGNED TO EACH

TREATMENT GROUP BY ACHIEVEMENT CLASSIFICATION

Achievement Classification	(I) Teachers Only	(II) Students Only	(III) Students/ Teachers	(IV) Control	Total
Mathematics	25	25	30	28	108
Science	22	23	19	22	86
Social Studies	27	28	27	28	110
Reading	30	29	32	32	123
Totals	104	105	108	110	427

Four hundred twenty-seven students were initially assigned to the four treatment groups resulting in a nearly uniform number in each experimental treatment group.

The teachers who participated in the study were members of the regular school staff in the thirteen buildings where eighth grade students were participants in this study. An attempt was made to provide information to all teachers who had one or more experimental students in an academic class. The teachers whose academic teaching areas corresponded to the standardized achievement sub-test administered to students in that school were singled out for information distribution. In that way teachers were included through a selection procedure, but exposure was not intentionally limited to these teachers. The students' membership in treatment groups determined whether student information was made available to the teacher.

TABLE II

NUMBER OF TEACHERS RECEIVING STUDENT INFORMATION AND EXPERIMENTAL TREATMENTS BY SCHOOL

School	Treatment Groups	Achievement Classification	Number of Teachers
A	I, II	Mathematics	7
B	I, IV	Science	11
B	II, III	Social Studies	(11)
C	I, III	Reading	4
D	III, IV	Mathematics	4
E	III, III	Science	4
F	II, IV	Social Studies	0
F	I, IV	Reading	6
G	II, III	Mathematics	4
H	II, IV	Science	0
I	I, III	Social Studies	7
I	II, IV	Reading	0
J	I, IV	Mathematics	4
K	I, II	Science	6
L	I, IV	Social Studies	6
M	II, III	Reading	4
	Total -		67

( ) = Duplication of teacher number in the same school

The number of students about whom a teacher received information depended on the number in his classroom and in which treatment group they were located.

DESIGN AND INSTRUMENTATION

The experimental design used for the study is a pre test - post test control group as described by Campbell and Stanley (in Gage, 1963). It may be diagrammed schematically as follows; with the X's representing the method of information dissemination (treatment groups) and the O's representing the testing with a standardized achievement instrument.

R	O	X_1	(O)	O
R	O	X_2	(O)	O
R	O	X_3	(O)	O
R	O	X_4	(O)	O

Where X = Exposure of units to experimental conditions.

X_1 = Student only received student appraisal information.

X_2 = Teachers only received student appraisal information

X_3 = Students and teachers received student appraisal information simultaneously.

X_4 = Test results only sent to school for cumulative record insertion (this group served as the control).

The R's in the diagram represent the experimental units (subclasses) which were assigned in a random manner to treatment groups. the (O)'s used in the schema represent an administration of the criterion measure as a part of the schools' standardized testing program.

This experimental design controls for all sources of internal invalidity caused by reactive arrangements. Campbell and Stanley state that,

> In much educational research there is no need whatsoever for students to know that an experiment is going on. If the X's are variants on usual classroom events occurring at plausible times, then one-third the battle is won when treatments occur without special announcement (p. 191).

The information communicated to students was presented during regular individual and group sessions by school counselors so a minimum of publicity would be evident.

Campbell and Stanley further state that,

> If the O's are similarly imbedded as regular examinations, the second requirement is achieved. If the X's are communications to individual students, then randomization can be achieved without the physical transportation of randomly equivalent samples to different classrooms, etc. (p. 191).

In this study the X's were communicated both to individu students and teachers, and the O's are the regularly scheduled examinations expected by students and teachers during the school year. Since make-up testing is a normal practice in the school system, the effect of experimental mortality was at a minimum.

Two instruments were used to obtain test results from students and to evaluate the effects of the experimental techniques.

The instrument used to measure scholastic aptitude was the Cooperative School and College Ability Test, Series II (SCAT - II), published by the Cooperative Test Division of Educational Testing Service in 1967. Two South Bend Schools had been included in the development of national norms for this test. Level 3, Form A of this test was administered to the 427 students involved in the study as a pre-measure for use as a co-variate in the analysis procedures. The test is used in the South Bend schools as part of the schools' testing program.

The Handbook, (1967) describes the test as follows: "Series II of the School and College Ability Test (SCAT, Series II) was designed to provide estimates of basic verbal and mathematical ability (p. 5)."

Through use of the SCAT II, the students' verbal and quantative abilities are measured. Many investigators of educational aptitudes have found these traits are closely related to success in school learning and predict ability to succeed in future academic work.

Three scores are reported: a Verbal score, a Mathematical score, and a Total score. These scores are reported in three ways: As a three-digit converted score, as a percentile band, and as a percentile rank. The computer program used in this research also generated a z-score based on the local distribution of raw scores.

The Handbook authors suggest that the "SCAT Series II tests can be useful as predictors of academic success (p. 42)."

The instrument used to measure scholastic achievement was the Cooperative Sequential Tests of Educational Progress (STEP), published by the Cooperative Test Division of Educational Testing Service in 1956. Normative data has been published in an updated manner periodically since that date. South Bend was listed as one of the cities participating in the 1963 Supplement describing Test Performance in Urban Schools. Level 3, Form A of this test was administered to the 427 students involved in the study as both a pre and post test for use as a criterian measure.

The STEP series is used in the South Bend schools as part of the schools' testing program. The STEP series is composed of six achievement tests with titles relating to major areas of school instruction: mathematics, science, social studies, reading, writing, and listening. Only one of the test series was administered to each student in the study according to the pre-determined achievement classification into

which the student was assigned.

These tests are aimed at determining the extent to which individuals have acquired certain critical skills and understandings. Broad understandings and abilities to utilize learned skills in solving new problems are the emphasis rather than merely the ability to handle factual information.

STUDENT APPRAISAL INFORMATION

The student appraisal information which was distributed to students and teachers was obtained through student self-report measures, teacher observations, and from cumulative record data. Where possible, the information was obtained from local sources or was reported using local normative comparisons. Several types of information were prepared and are described below through the collection, preparation and dissemination phases of information development for both the teacher group and the student group.

A. INFORMATION FOR TEACHERS USE

Three basic types of information were distributed to teachers in the form of unique computer printouts. Data for computer description were obtained from the pre-criterion test measures and the non-academic student rating by seventh grade teachers--both during May, 1968.

The first basic type of information given to teachers was a copy of the students' test profile which presents the ability and achievement test scores of individual students in numerical and graphic form. The reverse side of the profile contains instructions helpful in interpreting the profile.

The second type of information given to teachers was a summary report of the pre-achievement test results. The report groups test items by major concept areas and shows the relative strengths and weaknesses of students by school group for each achievement concept. The concepts measured and the items relating to each were determined from the Teacher's Guide, by the publishers of the STEP tests.

The third type of information for teacher use was a computer printout of individual students' character-trait ratings recorded by the seventh grade teacher at the time of pre-testing. The ratings were made on a five point Likert-type scale measuring the characteristics of initiative, leadership, industry, emotional stability, motivation, common sense and judgment, dependability and responsibility, consideration for others, and honesty and integrity.

All three reports were processed after the data was grouped by receiving school. This assured that information about students was reported in only the school from which it was gathered. This also guarded against imprudent disclosure of personal material.

If a teacher had members of the Teacher Only (I) or Student and Teacher (II) treatment groups in any of his classes, he received a copy of the material described above. An accompanying bulletin suggested ways of interpreting and using the information to learn more about the student and to look for clues to ways of helping him to improve.

Students were unaware that this kind of information was given to their teachers. Counselors and principals were the agents of dissemination and were free to distribute it as they desired. In some schools group meetings of teachers were held by counselors, while in others the packet of materials was simply given to the teacher. Verbal reports indicated administrators and counselors supported and encouraged this use of information.

Copies of each report form are included in the Appendix.

B. INFORMATION FOR STUDENT USE

Two basic types of information were prepared for distribution to students that had been designated as members of the Student Only (II) and Student and Teacher (III) treatment groups.

The first basic type of information interpreted to students was the test profile. Their copy was identical to the profile received by teachers. The reverse side of the profile contained interpretative remarks and the profile was inserted in a student workbook with several pages devoted to the interpretation and use of test results.

The second type of information given to students in the experimental groups was a workbook of locally-derived student appraisal information. Information assembled in the workbook was obtained from several sources:

1. The school records of a random sample of one-third of the class (approximately 2800) of students who had matriculated the ninth grade in the fall of 1968.
2. Recorded information reported by South Bend high school graduates during annual follow-up studies from 1959 through 1967.
3. Relevant information about students who dropped out of school prior to graduation.
4. Current national statistics and research results regarding the monitary value of formal education and the decision-making processes respectively.

Expectancy tables were prepared from the matriculated groups' end-of-year subject marks at the seventh and eighth grade levels. These were inserted between interpretive statements in the first part of the workbook. The second part was prepared as an aid to interpreting the test profile inserted in the booklet. Part III provided interpretation and statistics regarding both graduates and dropouts from the high schools of South Bend. The last Part of the booklet was intended as a

summary and review of the information contained in the first three parts. Students were encouraged to use the workbook in school as well as take it home to share with their parents.

All material for both teacher and student use was prepared and printed during the first two months of the 1968 school year and presented to counselors and/or principals from the thirteen participating schools in workshop sessions on October 31 and November 7, 1968. During the workshop each of the prepared information sources was discussed and those in attendance were instructed in the dissemination and use of the materials by the teacher and student groups with whom they were to work.

Periodically, throughout the first three months of the investigation, a telephone consultation was held with each counselor involved in the dissemination portion of the project. This helped to clear up questions about interpreting the material and provided some control over the process and progress of the project. This contact also provided a source of reaction to the material as a technique for use in the future with all teachers and students in the system.

The Appendix contains examples of all student information as well as materials used for disseminating the material.

DATA COLLECTION

Several instruments were utilized in the collection of data about students prior to, during, and at the end of the investigation.

Standardized ability test results were collected in May, 1968 and recorded in IBM card format for storage until statistical analysis was to be conducted. The results of standardized achievement testing were collected through pre-testing in May, 1968, during the regularly scheduled school testing programs in January and February, 1969, and again during the post-testing in the first two weeks of May, 1969.

In addition to standardized test results, information about the students involved was made available through the data bank of the Management Information Services of the South Bend Schools. This specific information was student sex, race, date of birth, and residence address. The residence address was used in conjunction with map inspection to determine whether the student was within or outside of a census tract considered Title I, E.S.E.A. (P.L. 89-10) eligible.

Non-academic character trait ratings were elicited during May, 1968, from seventh grade teachers familiar with the project students. The instrument used for this purpose was a mark-sense IBM card already in use at the high school level for biennial collection of this information. The instrument was designed during 1965 for use with students in the South Bend high schools. The results of a study to determine rater reliability in using the instrument are reported in the Appendix.

The dates on which student appraisal information was presented to appropriate students were recorded on a form prepared for this purpose. The form, for each school, contained only the names of those students who were eligible to receive the information as well as space for recording the dates they were present for distribution and explanation of the workbooks. The counselors recorded this information as the events evolved and returned it to the writer, thus providing another basis for outcome data analysis. This instrument and other locally-developed instruments may be found in the Appendix.

STATISTICAL ANALYSIS

Outcomes from this project were derived from four primary data sources: 1. Ability data, obtained from SCAT II test results; 2. Achievement data, obtained from STEP test results; 3. Classification data, obtained from student records and counselor report forms; and 4. Character-trait data, obtained from teacher responses on a Likert-type scale. Each of these data was analyzed with the statistical technique most appropriate to the research design and form of the data.

The following diagram indicates the level of each factor considered in the analysis of the data:

TABLE III

ANALYSIS OF CRITERION DATA

Achievement Tests	Experimental Treatments I	II	III	IV
Mathematics	C_1 C_2	C_3 C_4	C_5 C_6	C_7 C_8
Science	C_9 C_{10}	C_{11} C_{12}	C_{13} C_{14}	C_{15} C_{16}
Social Studies	C_{17} C_{18}	C_{19} C_{20}	C_{21} C_{22}	C_{23} C_{24}
Reading	C_{25} C_{26}	C_{27} C_{28}	C_{29} C_{30}	C_{31} C_{32}

C=Sub-Classes where variability exists in the number of subjects in each.

Achievement test scores obtained during the post-testing period of the study were converted to standard score form and analyzed for differences between treatments and among levels of the achievement tests. The scores were adjusted for influences of ability and achievement differences among students by a multiple analysis of covariance. The covariants used in the analysis were the ability and achievement test results gathered prior to the start of the

experiment. Differences were tested for significance using an F test with the level of significance established at .05. The purpose of this analysis was to test null hypotheses number 1 and 3 in the experiment.

A Biomedical Computer Program, Analysis of Covariance for Factorial Design, available at the Purdue Computer Science Center, was utilized to complete the computation.

Further multiple-covariance analysis was conducted between and among levels of achievement classifications utilizing another Biomedical Computer Program, One-Way Analysis of Covariance with Multiple Covariates, available at the Purdue Computer Science Center. Differences were tested for significance using an F test with the level of significance established at .05. The purpose of these analyses was to test null hypothesis number 2 in the experiment.

Each separate analysis with this multiple-covariance technique was conducted using respectively standard-score post-test results, converted score post-test results, standard score mid-test (schools' testing program) results, and converted score mid-test results.

Correlations between non-academic and academic variables in the study were computed and the significance of the correlations was tested at the .05 level of significance by means of Students' t tests. Further analysis of the correlations was conducted with the same statistical test by combining certain correlation coefficients and testing the differences between average correlation coefficients. A Biomedical Computer Program, Correlation With Item Deletion, available at the Purdue Computer Science Center, was utilized in the computation of product-moment correlation coefficients.

The purpose of these analyses was to test null hypothesis number 4 in the experiment.

Several post-analyses of the data were conducted using a multiple analysis of variance technique with the independent variables being those identified when student classification data were collected. i.e., sex, race, birth data, socio-economic level, and beginning date of student workbook utilization. Differences were tested using an F test with the level of significance established at .05. A Biomedical Computer Program, Two-Way Unequal Cell ANOVA, available at the Purdue Computer Science Center was utilized in the computation.

The purpose of these analyses was to test null hypotheses number 5 through 9 in the experiment.

CHAPTER IV

ANALYSIS OF THE DATA

The results of this investigation relevant to the primary and related hypotheses specified in Chapter One are presented in tabular and descriptive form in this chapter. The first of three parts focuses on the characteristics of the student sample at the pre, mid, and post periods of the experiment. This section compares local data with national results for the tests used in the study.

The second part describes results that justify the use of local standard scores as the unit for comparing and equating results between different achievement sub-tests. That which is presented contradicts the use of the converted score scale presented in the test publisher's interpretive manuals. The rationale for the use of analysis of covariance is also presented in this section.

The third and final part of the chapter summarized the data used to test each of the major hypotheses as well as post-analysis hypotheses.

CHARACTERISTICS OF THE STUDENT SAMPLE

Sub-classes were assigned as intact units during the sampling part of the study, consequently each cell of the experimental model varied in respect to the numbers of students it contained. Over the period of one school year twenty-seven students were "lost" and data from them could not be included in the analysis. Those 27 students' scores were not extreme variates from the average scores of the total student sample. The number lost from all cells in the model appeared to be random-like.

Table IV presents the number of subjects in each group at the time of each testing. It may be seen by examining the data presented in Table IV that the 27 students lost from the experiment over the school year did not appear to depart in any systematic manner. In this table all but four cells have remaining student numbers in the twenties. The four exceptions included one cell that contained sixteen and three cells that contained thirty, thirty, and thirty-one student scores, respectively.

TABLE IV
NUMBER OF SUBJECTS IN EACH GROUP AT THE TIME OF PRE, MID, AND POST TESTING

Achievement Classification		Treatments I		II		III		IV		Total	
		Pre	Mid & Post	Pre	Mid & Post	Pre	Mid & Post	Pre	Mid & Post	Pre	Mid & Post
9	Math.	25	20	25	24	30	30	28	25	108	99
6	Science	22	20	23	23	19	16	22	21	86	80
5	Soc. St.	27	20	28	28	27	23	28	27	110	105
7	Read.	30	30	29	26	32	29	32	31	123	116
	Total	104	97	105	101	108	98	110	104	427	400
Loss		7		4		10		6		27	

Scholastic ability data available in the SCAT II Handbook do not constitute a direct means for comparing raw score results of local and national samplings because of the grade level at which the samplings were reported. Although SCAT II, Form 3A was used in both cases, the reported national sample closest to this project grade level (grade 7) was grade 8. Data presented in Table V show that all three national test means were higher than local test means. This result was expected, however, examination of Table V reveals that the standard deviations of the two groups were approximately the same. The differences that appear in Table V in standard errors of the mean may be the result of having a larger, more varied population from which the national samples were drawn.

TABLE V
MEANS, STANDARD DEVIATIONS, AND STANDARD ERRORS OF THE MEAN COMPARISONS BETWEEN TEST MANUFACTURER (ETS) AND PROJECT SAMPLE RAW SCORE DATA FOR SCAT SERIES II FORM 3A

Group	Grade	No. of Examinees	Scale	Mean	Std. Dev.	S.E. of the Mean
ETS	8	100	Verbal	32.1	8.67	.97
		100	Math.	33.1	7.80	.87
		100	Total	65.2	15.16	1.71
Project	7	415	Verbal	28.6	8.72	.43
		412	Math.	30.3	8.18	.40
		412	Total	58.9	15.67	.77

Data presented in Tables VI through IX provide comparisons between the raw score results of local and national samples of student achievement (STEP). From these tabular data, certain findings are evident. The seventh grade raw score achievement test means are higher at the local level than those of the national sample at the eighth grade level. The exception is the STEP Science sub-test. Comparisons of the scores produced on this Science subtest show the mid-year eighth grade samples to be alike on both local and national norms.

Normal learning progress appeared to have taken place in the project schools as evidenced by the progressive increase in achievement test raw scores throughout the period of the experiment. The variability of all local and national results appeared quite similar at the mid-year eighth grade level. The standard deviations of both the Mathematics and Science achievement sub-tests were nearly alike for local and national samples. Greater variability appears to be present for the national sample in the Social Studies and Reading results, but these differences in deviation are no more than three raw score points.

In general then, the local sample may be different from a national sample by having higher average achievement test results at the same grade level. The exception to this is the Science results.

TABLE VI

MEANS, STANDARD DEVIATIONS, AND STANDARD ERRORS OF THE MEAN COMPARISONS BETWEEN TEST MANUFACTURER (ETS) AND PROJECT SAMPLE RAW SCORE DATA FOR STEP MATHEMATICS, FORM 3A

Group	Grade	No. of Examinees	Mean	Std. Dev.	S.E. of the Mean
ETS	8	100	23.05	7.41	.75
Project:					
Pre-test	7	106	24.8	8.00	.78
Mid-test	8	101	27.4	8.19	.82
Post-test	8	98	28.9	8.43	.86

TABLE VII

MEANS, STANDARD DEVIATIONS, AND STANDARD ERRORS OF THE MEAN COMPARISONS BETWEEN TEST MANUFACTURER (ETS) AND PROJECT SAMPLE RAW SCORE DATA FOR STEP SCIENCE, FORM 3A

Group	Grade	No. of Examinees	Mean	Std. Dev.	S.E. of the Mean
ETS	8	100	34.1	10.22	1.03
Project:					
Pre-test	7	88	31.6	9.84	1.06
Mid-test	8	82	33.8	10.99	1.22
Post-test	8	77	36.8	9.68	1.11

TABLE VIII

MEANS, STANDARD DEVIATIONS, AND STANDARD ERRORS OF THE MEAN COMPARISONS BETWEEN TEST MANUFACTURER (ETS) AND PROJECT SAMPLE RAW SCORE DATA FOR STEP SOCIAL STUDIES, FORM 3A

Group	Grade	No. of Examinees	Mean	Std. Dev.	S.E. of the Mean
ETS	8	100	42.6	11.90	1.19
Project:					
Pre-test	7	108	47.3	10.24	.99
Mid-test	8	102	51.4	10.17	1.01
Post-test	8	106	53.6	9.22	.90

TABLE IX
MEANS, STANDARD DEVIATIONS, AND STANDARD ERRORS
OF THE MEAN COMPARISONS BETWEEN TEST MANUFACTURER (ETS) AND
PROJECT SAMPLE RAW SCORE DATA FOR STEP READING, FORM 3A

Group	Grade	No. of Examinees	Mean	Std. Dev.	S.E. of the Mean
ETS	8	100	37.3	11.23	1.13
Project:					
Pre-test	7	123	38.0	9.97	.90
Mid-test	8	114	45.0	8.22	.77
Post-test	8	117	46.5	8.58	.80

COMPARING AND EQUATING DIFFERENCES

The test results have been placed in any one of four forms for analysis. Raw scores were considered inappropriate because the achievement tests differed with respect to numbers of test items. Percentile scores were available, but were considered inappropriate because of the difficulty inherent in manipulating ordinal scales. The publisher's test manuals present converted scores. This converted score is a scale purported to equate all test forms of each STEP test. However, the manual for the ability measure used in this study cautions that converted scores for this scholastic ability test series do not equate resultant scores. Because of this limitation, score scales were not used for the ability measure employed in this study. However, the achievement results were placed in converted scale scores and subjected to analysis.

A unit by which both SCAT II and STEP test results could be equated and compared was a standard score scale based upon local test results. Therefore, a T score (mean = 500, standard deviation = 100) was computed for each raw score of the separate STEP sub tests using the pre, mid, and post test results as the basis for each test norm. An identical T score was also computed for each raw score of the Verbal, Mathematical, and Total sections of the SCAT II battery.

TABLE X
ANALYSIS OF VARIANCE OF PRE-STEP ACHIEVEMENT
TEST RESULTS IN STANDARD SCORE FORM

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Achievement Classifications	3	2355.006	785.002	.08
Treatments	3	100723.155	33574.385	3.50*
Interaction	9	122278.498	13586.500	1.42
Within (error)	384	3679068.376	9580.907	--

* $F_{.95}$ (3,384) = 2.62

Analysis of variance procedures were used to detect significant differences between and among scores obtained at the pre, mid, and post achievement testing. Both T score (standard score) form and converted score form (for achievement only) were used. These data are presented in Tables X through XV.

TABLE XI
ANALYSIS OF VARIANCE OF PRE-STEP ACHIEVEMENT
TEST RESULTS IN CONVERTED SCORE FORM

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Achievement Classifications	3	3891.565	1297.188	7.48**
Treatments	3	1644.779	548.260	3.16*
Interaction	9	2083.607	231.512	1.34
Within (error)	384	66560.604	173.335	--

* $F_{.95}(3,384) = 2.62$
** $F_{.99}(3,384) = 3.84$

TABLE XII
ANALYSIS OF VARIANCE OF POST-STEP ACHIEVEMENT
TEST RESULTS IN STANDARD SCORE FORM

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Achievement Classifications	3	5281.761	1760.587	.19
Treatments	3	156926.647	52308.882	5.52**
Interaction	9	118436.507	13159.612	1.39
Within (error)	384	3639237.542	9477.181	--

** $F_{.99}(3,384) = 3.84$

TABLE XIII
ANALYSIS OF VARIANCE OF POST-STEP ACHIEVEMENT
TEST RESULTS IN CONVERTED SCORE FORM

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Achievement Classifications	3	13820.912	4604.971	29.16**
Treatments	3	2213.934	737.978	4.67**
Interaction	9	1881.069	209.008	1.32
Within (error)	384	60662.970	157.976	--

** $F_{.99}(3,384) = 3.84$

TABLE XIV
ANALYSIS OF VARIANCE OF MID-STEP ACHIEVEMENT
TEST RESULTS IN STANDARD SCORE FORM

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Achievement Classifications	3	19023.194	6341.065	.35
Treatments	3	267749.749	89249.916	4.92**
Interaction	9	138568.427	15396.492	.85
Within (error)	384	6965400.585	18139.064	--

** F .99 (3,384) = 3.84

TABLE XV
ANALYSIS OF VARIANCE OF MID-STEP ACHIEVEMENT
TEST RESULTS IN CONVERTED SCORE FORM

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Achievement Classifications	3	8385.966	2795.322	.95
Treatments	3	26878.561	8959.520	3.05*
Interaction	9	9734.279	1081.587	.37
Within (error)	384	1128818.814	2939.632	--

* F .95 (3,384) = 2.62

Inspection of the data presented in Table X reveals that no statistically significant difference existed between achievement classifications (mathematics, science, social studies, reading) using the standard score form (T) on the STEP pre-test. However, a significant difference does exist in these data when a converted score form is employed (see Table XI).

Tables XII and XIII report the ANOV results for the post-STEP achievement testing. Again, no difference was present when the standard score (T) was utilized but a difference did exist when the converted scale form was subjected to analysis.

Tables XIV and XV report ANOV results for the mid-STEP achievement testing. Inspection of these data reveals that no difference was present when either form was utilized. No plausible reason can be given to explain why this took place.

Based upon the data presented in Tables I through XV, it was concluded that the computed T score was an appropriate unit to employ when comparisons are to be made between and among STEP achievement sub tests.

An analysis of variance procedure was used to detect significant differences between and among the Verbal, Mathematical, and Total SCAT II T score results. A summary of these data is presented in Tables XVI, XVII, and XVIII. Examination of these data reveal that ability levels of the students are not significantly different between treatment groups (Group I, Teachers only; Group II, Students only; Group III, Students and Teachers; Group IV, Control), but that a statistically significant difference exists between achievement classifications (mathematics, science, social studies, and reading). This result could be expected because the achievement levels parallel, at least to some degree, social-economic differences within the schools of the system. That is, one class (or two in larger schools) was selected from each participating school and administered only one of four possible STEP tests; therefore, the achievement levels could be said to reflect different groupings of students with regard to scholastic ability.

TABLE XVI
ANALYSIS OF VARIANCE OF PRE-SCAT-II
VERBAL SCORE RESULTS IN STANDARD SCORE FORM

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Achievement Classifications	3	177346.153	59115.384	6.41**
Treatments	3	71607.725	23869.242	2.59
Interaction	9	177482.509	19720.279	2.14*
Within (error)	384	3542281.402	9224.691	--

** F .99 (3,384) = 3.84
* F .95 (9,384) = 1.90

TABLE XVII
ANALYSIS OF VARIANCE OF PRE-SCAT-II
MATHEMATICAL SCORE RESULTS IN STANDARD SCORE FORM

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Achievement Classifications	3	238978.841	79659.614	8.36**
Treatments	3	17603.707	5867.902	.62
Interaction	9	189352.698	21039.189	2.21*
Within (error)	384	3659007.150	9528.664	--

** F .99 (3,384) = 3.84
* F .95 (9,384) = 1.90

TABLE XVIII
ANALYSIS OF VARIANCE OF PRE-SCAT-II
TOTAL SCORE RESULTS IN STANDARD SCORE FORM

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Achievement				
Classifications	3	236441.476	78813.825	8.58**
Treatments	3	45055.115	15018.372	1.64
Interaction	9	181001.633	20111.293	2.19*
Within (error)	384	3527124.925	9185.221	--

** $F_{.99}$ (3,384) = 3.84
* $F_{.95}$ (9,384) = 1.90

The random sampling procedure used to assign subjects to treatment groups in this study were not effective. Significant differences between treatment groups were evident in the data presented in Tables X through XV. Therefore, an analysis of covariance technique was employed as a means of equating these treatment groups. Table XIX summarizes the coefficients of correlation between and among the criterion and covariate scores. Examination of the data in Table XIX reveals that the coefficients range from .65 to .93 and meet the necessary underlying assumption of correlation between criterion and covariate(s) when an analysis of covariance technique is employed.

The usefulness and appropriateness of each of the four covariates in the regression model were determined by an overall F test on the residuals. The F (4,236) = 99.645 was found to be significant at the .01 level. Thus the covariates were contributing to an adjustment of the criterion through statistical control.

TABLE XIX
AVERAGE COEFFICIENTS OF CORRELATION AMONG
SCAT II AND STEP TEST SCORES**

	SCAT II Math	SCAT II Total	Pre STEP	Post STEP
SCAT II Verbal	.71	.93	.68	.66
SCAT II Math		.92	.65	.66
SCAT II Total			.72	.71
Pre STEP				.77

** = Significant at the .01 level
N = 99, 90, 79, and 107 for the respective correlations averaged above.

TESTS OF MAJOR AND POST ANALYSES HYPOTHESES

The first major hypothesis stated that there would be no difference between the post achievement scores of control group students and those who had student appraisal information interpreted to them, their teachers, or both. To test this hypothesis an analysis of covariance for factorial designs was utilized. The computation procedure specified that an equal number of observations must be present in each cell, so each cell was adjusted until sixteen scores remained. Since the smallest cell total (n = 16) was not reduced, fifteen cells were adjusted by a random elimination procedure utilizing a table of random numbers.

The covariates employed in the analysis were the Verbal, Mathematical, and Total scores of the SCAT II and the pre-test criterion STEP measure. The multiple classification analysis of covariance detected no significant difference at the .05 level in student achievement. Data presented in Table XX summarize the results of this analysis. Inspection of these data reveals that communication of student appraisal information had no significantly measurable effect upon students' achievement test performance. Therefore, the first hypothesis was accepted.

TABLE XX
SUMMARY OF FACTORIAL ANALYSIS OF COVARIANCE

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Achievement Classification	3	1669.036	556.345	.158
Treatments	3	25247.414	8415.805	2.384
Interaction	9	38265.618	4251.735	1.206
Within	236	833038.490	3529.824	--

$F_{.95}(2,236) = 2.64$

The third major hypothesis stated that no difference will exist at the end of the experiment between and among experimental subjects classified by achievement levels. This hypothesis was tested by factoral analysis of covariance. The data presented in Table XX showed that no significantly measurable difference existed at the end of the experimental study between and among students classified in each of the achievement areas measured. Therefore hypothesis three was accepted.

The second major hypothesis of this study stated that there would be no difference between and among the achievement test scores of students exposed to differential methods of presenting appraisal information. (Group I, Teachers Only; Group II, Students Only; Group III, Students and Teachers; and Group IV, Control). To adequately test the hypothesis an unequal cell one-way analysis of covariance (multiple covariates) was employed. Throughout this analysis and others that

utilize multiple covariates, the covariates include SCAT II Verbal, Mathematical, and Total scores and the pre test STEP achievement scores.

The results reported in Table XXI show that the observed F ratio, F = 3.018 is larger than the critical value $F_{.95}(3,392) = 2.63$. This result indicates that a difference existed in the adjusted means after the period of experimentation.

TABLE XXI
DIFFERENTIAL TREATMENT EFFECTS ON POST-STEP ACHIEVEMENT TEST SCORES AS TESTED BY ONE-WAY ANALYSIS OF COVARIANCE (MULTIPLE COVARIATES)

Source of Variation	df	Adjusted Sum Of Squares	Mean Squares	F Ratio
Treatments + Within	395	1444159.783		
Within	392	1411553.016	3600.901	
Treatments	3	32606.766	10868.992	3.018*

* $F_{.95}(3,392) = 2.63$

Winer (1962) sets forth a method of comparing all treatment means with the mean of a control group. The application of Dunnett's t statistic to compare the three treatment means to the control mean takes the following form

$$t = \frac{\bar{T} - \bar{T}\,(\text{control})}{\sqrt{2MS_{\text{error}}/n}}$$

Since the treatment sample sizes are unequal, a harmonic sample size was computed (100) and used in the analysis. The critical value for an .05 level test using $t_{.95}(392) = 2.06$. Table XXII provides information about the means and standard errors for each treatment.

TABLE XXII
TABLE OF ADJUSTED MEANS AND STANDARD ERRORS FOR POST-STEP ACHIEVEMENT TEST SCORES

	Treatment			
	I	II	III	IV
Adjusted Mean	488.295	490.501	507.663	507.642
S.E. Adjusted Mean	6.144	5.988	6.075	5.940

I = Teachers Only, II = Students Only, III = Students and Teachers
IV = Control

The observed t statistic comparing Treatment I (Teachers Only) with the control was 2.28 and was the only comparison that exceeded the critical value. An interpretation of this result suggests that the adjusted mean test scores produced by students whose teachers were given appraisal information were significantly lower than those of a control group to whom no information was communicated. Further comparisons showed that Treatment I (Teachers Only) and Treatment III (Students and Teachers) differed significantly on the criterion scores. This difference would indicate that the adjusted mean test scores produced by students whose teachers were given appraisal information were significantly lower than those in which the teachers and students both received appraisal information.

In addition to determining differences at the end of the experimental study, a one-way analysis of covariance (multiple covariates) was utilized with criterion scores available through the administration of the schools' standardized testing program. These scores became available approximately at the mid-point of the experiment.

The results of this analysis reveal that the observed F ratio, $F = 2.854$ is larger than the critical value $F_{.95}(3,392) = 2.63$. This result indicates a difference existed in the adjusted means at or near the middle of the period of experimentation.

TABLE XXIII
DIFFERENTIAL TREATMENT EFFECTS ON MID-STEP ACHIEVEMENT TEST SCORES AS TESTED BY ONE-WAY ANALYSIS OF COVARIANCE (MULTIPLE COVARIATES)

Square of Variation	df	Adjusted Sum of Squares	Mean Squares	F Ratio
Treatments + Within	395	4122800.408		
Within	392	4034678.261	10292.547	
Treatments	3	88122.1473	29374.049	2.854*

* $F_{.95}(3,392) = 2.63$

Comparisons were conducted using Dunnett's ν and tested against the critical value $t_{.95}(392) = 2.06$. These data are reported in Table XXIV. The observed t statistic comparing treatment I (Teachers Only) with the control was 2.11 and was the only comparison that exceeded the critical value. This result suggests that the adjusted mean test score produced by students whose teachers were given appraisal information was significantly lower than that of a control group to whom no information was communicated. Further comparisons showed that treatment I (Teachers Only) and II (Students Only) both differed significantly from treatment III (Students and Teachers) on the criterion test scores. This difference would suggest that the adjusted test scores produced by students who were given and whose

teachers were given appraisal information independent of each other were significantly lower than those in which the appraisal information was communicated to students and teachers simultaneously. Therefore, hypothesis II was rejected.

TABLE XXIV
TABLE OF ADJUSTED MEANS AND STANDARD ERRORS
FOR MID-STEP ACHIEVEMENT TEST SCORES

	Treatment			
	I	II	III	IV
Adjusted Means	467.596	469.932	504.443	489.276
S.E. Adjusted Means	10.387	10.124	10.271	10.043

I = Teachers Only, II = Students Only, III = Students and Teachers
IV = Control

Table XXIV provides information about the means and standard errors for each treatment.

A post analysis hypothesis (number five) was whether the timing of the distribution of student appraisal information was an important consideration in the experiment. This question was investigated through post analysis of the data by utilizing a two-way unequal cell analysis of variance procedure. Since only two treatment groups (II and III) provided for student receipt of information, these were the only treatment levels considered. The dates on which students initially received their data were ranked and formed into three groups based upon clustering of the dates. The first group of dates was closest to the beginning of the project and included the school days from November 18, 1968 through December 23, 1968. The second group ran from January 13 to February 7, 1969, and the third group, closest to post testing, received information between February 24, 1969 and the end of the project.

Table XXV presents the results of this analysis. The observed F ratios for dates of presentation and interaction effects are larger than the critical value $F_{.95}$ (2,191) = 3.04. However, further analysis by the Scheffé technique (Winer, 1962, p. 88) revealed that the differences in achievement as a function of the dates during which information was communicated to students were not significant. While hypothesis five was accepted, an analysis of the interaction effects indicated that of those students who had received appraisal data earliest, Treatment II (Students Only) students had higher mean scores than did their counterparts (Treatment III) whose teachers also received appraisal data. The opposite trend appears with students who received appraisal data near the date of post testing. With this group, the teacher and student recipients produced higher criterion scores. These results may suggest that students had not had time to complete study of the appraisal information prior to the post test.

It might also indicate that an initial difference existed with this group. The mean criterion results for the respective time periods were: 514.828, 492.773, and 452.112. The results of the previous analysis indicate timing was not important with regard to the distribution of student appraisal information even though the groups who had appraisal data for the longest period of time had the highest mean criterion scores.

TABLE XXV
ANALYSIS OF VARIANCE FOR DATES OF INFORMATION COMMUNICATION

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Dates of Distribution	2	82303.621	41151.811	4.59*
Treatments	1	2217.583	2217.583	.25
Interaction	2	74664.837	37332.418	4.17*
Error	191	1711538.895	8960.937	--

* $F_{.95}(2,191) = 3.04$

Hypothesis six sought to determine whether differences existed between the performance of male and female students on the criterion measure. This hypothesis was investigated through a two-way unequal cell analysis of variance procedure. A summary of these data is presented in Table XXVI. Inspection of the data presented in Table XXVI reveals that the observed F ratio showed no difference between the sexes with regard to performance on the criterion. Hypothesis six was accepted.

TABLE XXVI
ANALYSIS OF VARIANCE FOR MALE AND FEMALE STUDENTS

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Sex	1	24897.861	24897.861	2.62
Treatments	3	166108.629	55369.543	5.83**
Interaction	3	13370.845	4456.948	.47
Error	392	3725326.419	9503.384	--

** $F_{.99}(3,392) = 3.83$

Hypothesis seven asked whether differences existed on the criterion measure for students whose birth dates would make them older or younger than their peers. As before, this post-analysis was conducted using a two-way unequal cell analysis of variance procedure. The dates of birth of the project students were ranked and formed into three groups based upon the normal admission birth dates of students entering school for the first time. The oldest

students formed the first group and their birth dates ranged from March, 1952 through September, 1954. Group two included the birth dates of October, 1954 through June, 1955 and the third group included students born after July 1, 1955. The respective mean criterion results for the three groups were: 484.500, 495.155, and 526.837. Table XXVII summarizes these data.

The observed F ratios for birth dates and treatments are larger than the critical values $F_{.95}(2,388) = 3.02$ and $F_{.95}(3,388) = 2.63$. Comparisons were conducted using the conservative method by Scheffé (not shown in tabular form) and no difference in achievement was detected between the birth date groups of students.

TABLE XXVII
ANALYSIS OF VARIANCE FOR DATES OF BIRTH

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Date of Birth	2	80813.091	40406.545	4.58*
Treatments	3	264382.696	88127.565	9.99*
Interaction	6	102306.724	17051.121	1.93
Error	388	3422143.729	8819.958	--

* $F_{.95}(2,388) = 3.02$
* $F_{.95}(3,388) = 2.63$

Hypothesis eight asked whether the performance of students in the study differed based upon their racial group membership. This question was investigated by utilizing a two-way unequal cell analysis of variance technique. These data are presented in Table XXVIII. The observed F ratio for race is larger than the critical value $F_{.95}(1,392) = 3.86$. After testing for significance using the Scheffé procedure there appeared to be a significant difference between the achievement of project students from different races. There was no significant interaction effect with respect to treatments, so no further investigation was considered.

TABLE XXVIII
ANALYSIS OF VARIANCE FOR RACE

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Race	1	156253.810	156253.810	17.50*
Treatments	3	141407.758	47135.919	5.28*
Interaction	3	60482.324	20160.775	2.26
Error	392	3499194.292	8926.516	--

* $F_{.95}(1,392) = 3.86$
* $F_{.95}(3.392) = 2.63$

Hypothesis nine asked whether the performance of students residing in the geographic areas eligible for Title I, E.S.E.A. (P.L. 89-10) assistance was different from those residing outside these geographical areas. A two-way unequal cell analysis of variance procedure was utilized to test this hypothesis. A summary of these data is presented in Table XXIX.

Significant differences were found between and among the performance of students from the two geographical residential areas. The observed F ratio for residential areas was larger than the critical value $F_{.95}(1,392) = 3.84$. In addition to main effect differences, the F ratio for interaction effects exceeded the critical value $F_{.95}(3,392) = 2.62$. The main effects for significance were tested by the Scheffe' procedure and a significant difference existed between the achievement scores students from the two different geographical areas. Hypothesis nine was rejected.

Those students from "poverty" residential areas performed proportionately less well in the treatment group where "students only" received appraisal data. Although interpretation of these results cannot conclude causal relationships, the greatest difference between achievement means within treatments is with treatment II (student only).

TABLE XXIX
ANALYSIS OF VARIANCE FOR AREA OF RESIDENCE

Source of Variation	df	Sum of Squares	Mean Square	F Ratio
Area of Residence	1	273861.472	273861.472	32.09*
Treatments	3	175920.510	58640.170	6.87*
Interaction	3	125537.419	41845.806	4.90*
Error	392	3344974.926	8533.099	--

* $F_{.95}(1,392) = 3.84$
* $F_{.95}(3,392) = 2.62$

Hypothesis four stated that no difference existed between the correlation of non academic (personality) traits with measures of academic ability and achievement.

Pearson product-moment correlation coefficients were computed between the measure of non-academic (personality) traits and raw scores on the SCAT II Total and STEP tests. A two-tailed t test for correlated data was used to measure differences between the correlations. Table XXX presents these results. Inspection of the data presented in Table XXX reveals that no difference was significant between the coefficient for non-academic traits with measures of academic (SCAT II) ability and the coefficient for non-academic traits with measures of achievement (STEP). Therefore, hypothesis

four was accepted. However, the low intercorrelations suggest that the non-academic traits are measuring some uniqueness that is not present in either ability or achievement test results. Although no comparison is present in the SCAT II manual, the correlation between ability and achievement measures in this study was .68. This is somewhat lower than correlations between SCAT and STEP scores in the STEP manual.

TABLE XXX
CORRELATIONS BETWEEN NON-ACADEMIC CHARACTER RATINGS, SCAT II TOTAL RAW SCORES, AND STEP RAW SCORES

TRAIT	Correlation Coefficients SCAT II	STEP
Initiative	-.34	-.32
Leadership	-.34	-.31
Industry	-.42	-.42
Emotional Stability	-.32	-.31
Motivation	-.40	-.35
Common Sense and Judgment	-.41	-.37
Dependability and Responsibility	-.37	-.33
Consideration for Others	-.25	-.28
Integrity and Honesty	-.29	-.28
Average All Ratings	-.35	-.35

CHAPTER V

SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The major objective of this study was to investigate the effects upon students' standardized achievement test scores as a result of communicating student appraisal information to eighth grade students and their teachers. Subjects were students enrolled in the South Bend, Indiana schools. Sixteen intact classes of eighth grade students were selected to participate in the study through a random assignment of classrooms to one of six achievement sub-tests (Mathematics, Science, Social Studies, Reading, Writing, and Listening). Students were pre-tested by administering the SCAT II as an ability measure and STEP as a pre-achievement measure. These pre-test results as well as character-trait ratings provided by previous teachers formed the basic data which was communicated to select teachers of the student sample. Pre-test results as well as expectency table presentations of prior students' end-of-year subject marks at the seventh and eighth grade levels were placed in workbook form for interpretation by select students in the student sample.

Subjects were assigned to three treatment groups or a control group. In Treatment I teachers received character trait ratings as well as the ability and achievement test results of certain students (n = 104) in their eighth grade classes. These teachers were urged verbally and in written form to utilize this information as an aid to understanding the student and to assist him in improving his level of academic performance. Treatment II involved providing selected students (n = 105) with student appraisal information in workbook form through individual and group interpretation sessions. The school counselor provided this interpretation after inservice training in procedures. In Treatment III another group of students (n = 108) and their teachers received appraisal information simultaneously, combining the Treatment I and Treatment II approaches. In Treatment IV no feedback of information was provided and the identified students (n = 110) were considered no-treatment control subjects.

The data collected as criterion outcomes were standard score (T) results of the STEP achievement tests. Three major hypotheses and six post analyses hypotheses were formulated. The hypotheses were tested through analysis of covariance and analysis of variance procedures. The .05 level was established as the critical level of significance.

Hypothesis one stated that at the conclusion of the study the experimental subjects will not differ significantly from control subjects on standardized achievement test scores, and hypothesis three stated that no significant difference would exist in achievement test scores between and among experimental students classified by, a) reading achievement, b) mathematics achievement, c) social studies achievement, and d) science achievement. These hypotheses were tested by factorial analysis of covariance techniques (multiple co-

variates). The factorial model that was employed utilized a greatly reduced sample size. Differences were not present and these two null hypotheses were accepted.

Hypothesis two stated that at the conclusion of the study no significant difference will exist in standardized achievement test scores between and among experimental subjects classified by treatments a) their teachers only received student appraisal data, b) students only received appraisal data, c) both students and their teachers received appraisal data, and d) control subjects (who did not receive data feedback). This hypothesis was tested by a one-way analysis of covariance technique (multiple covariates). The results indicated that a significant difference existed between post achievement test scores of the control group students and students in Treatment I (teachers only given student appraisal data). Those students whose teachers only were given student appraisal information had lower post-achievement test scores than the control group. Further, a significant difference existed between Treatment I (teachers only given student appraisal data) and Treatment III (both teachers and students given appraisal data). Those students whose teachers only were given student appraisal information had lower post-achievement test scores than those students who received and whose teachers received appraisal information. Therefore, this null hypothesis was rejected.

Six post-analysis null hypotheses were formulated and tested. Fundamentally these hypotheses were that no significant difference existed in the standardized achievement test results between 1) students to whom data were communicated close to post-testing and those to whom data were communicated close to pre-testing, 2) male and female students, 3) relative month of student birth dates, 4) black and white students, 5) residential areas of students, and 6) measures of non-academic (personality) traits and ability and achievement measures. All save the last hypothesis were tested utilizing an analysis of variance technique. The last hypothesis was tested by a two-tailed t test for correlated data. No significant difference was present by sex, birth dates, or the time of year during which information was presented to students. Significant differences were present by race and socio-economic levels. Further comparisons using the Scheffé technique suggested that providing lower socio-economic students only with appraisal information may have a negative influence upon their achievement results. Finally, t tests revealed that no significant differences existed between the non-academic to ability test score relationship and the relationship of non-academic to achievement test scores.

DISCUSSION

The factorial analysis of covariance results indicate that no difference existed between experimental subjects and control subjects on standardized achievement test scores at the conclusion of the study. However the factorial model utilized for this analysis

specified that equal cells be employed. Consequently, the reduction of subjects in any cell (as many as fifteen from one cell) may have contributed to a reduction in variability of test scores. It could be speculated that if analysis could have proceeded with all subjects retained in every cell, a different outcome might have been possible.

When experimental subjects classified by treatments were compared on standardized achievement test scores at the end of the experimental period, significant differences were present between those students whose teachers only received student appraisal data and students in the control group. The control group students achieved higher adjusted mean achievement test scores. Presumably providing teachers only with appraisal data impedes student results on standardized achievement tests. It could be speculated that giving teachers appraisal data about students may establish evaluations and expectations that are communicated to students and that are non-facilitative with regard to student achievement test scores. Analysis of the results does not reveal the dynamics of teacher-student relations which produced the differences, if indeed they did. The finding suggests that teachers' evaluations may affect the student's conception of his ability to achieve and may thus set limits on his school achievement.

When experimental subjects classified by treatments were compared on standardized achievement test scores at the end of the experimental period, significant differences were present between those students whose teachers only received student appraisal data and those students who received and whose teachers received student appraisal data. Those students and their teachers who received appraisal data had higher adjusted mean achievement test scores than those students whose teachers only received appraisal data. Presumably it is more effective to present teachers and students with appraisal data than just presenting such data to teachers alone. Speculation here is that when both parties have access to and knowledge of appraisal data, it serves as an interacting influence that affects the achievement of the student. Again, the dynamics of the teacher-student relations that may have produced the differences are not evident in the data. The findings suggest that an information-augmented student self-concept may provide the student with a mechanism to realistically deal with teacher communicated expectations.

The post analysis revealed that white students scored higher on achievement tests than black students and that those students who reside in "poverty" areas scored lower than those residing outside such a geographical area. Other related studies have supported this finding and these socio-economic differences need little further explanation. However, analysis revealed that interaction was present between lower socio-economic students and the treatment in which students only received appraisal data. Presumably providing lower socio-economic class students only with appraisal data is inimical. It may be speculated here that these data generally tend to reinforce a poor self-image and that this is reflected in their post testing behavior.

CONCLUSIONS

The major conclusions from this study may be summarized as follows:

1. Providing students and their teachers with locally-derived student appraisal information has little, if any, effect upon students' achievement test scores.
2. Providing locally-derived student appraisal information to teachers alone seems to have an inimical effect on the functioning of students on achievement tests.
3. It is less effective to provide locally-derived student appraisal information to teachers alone than it is to provide this same information to both teachers and students.
4. Providing locally-derived student appraisal information to students from the economic disadvantaged areas seems to be inimical to their functioning on achievement tests.

RECOMMENDATIONS

1. The approach of this study needs replication to determine if similar results appear, and if so, to consider the implications for testing and appraisal programs in the schools as a possible deterrant to achievement.
2. Perhaps student ability levels should be used as a classification factor to determine if students at different ability levels may be able to utilize appraisal data more effectively to improve achievement.
3. In addition to providing locally derived student appraisal information through the experimental approaches of this study, its usefulness with parents needs to be investigated.
4. The non-academic rating card used with this experiment should be researched further to determine the validity of the instrument when used for assessing student characteristics at the junior high school level.
5. Future investigators in this realm need to consider ways for assuring uniformity in the use of appraisal data by teachers through direct and sufficient in-service training.

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CONCEPT ANALYSIS

STEP SCIENCE FORM 3A — 05/68 DATE TESTED

CONCEPT	SCHOOL			
REASON QUANTITATIVELY	27 MONROE	GRADE 7	23 STUDENTS	11 TEST ITEMS ANALYZED
	59.3% ANSWERED CORRECTLY	37.2% ANSWERED INCORRECTLY	3.6% OMITTED AN ANSWER	
EVALUATE CRITICALLY	27 MONROE	GRADE 7	23 STUDENTS	5 TEST ITEMS ANALYZED
	64.3% ANSWERED CORRECTLY	32.2% ANSWERED INCORRECTLY	3.5% OMITTED AN ANSWER	
DRAW CONCLUSIONS	27 MONROE	GRADE 7	23 STUDENTS	4 TEST ITEMS ANALYZED
	46.7% ANSWERED CORRECTLY	48.9% ANSWERED INCORRECTLY	4.3% OMITTED AN ANSWER	
SELECT VALID PROCEDURES	27 MONROE	GRADE 7	23 STUDENTS	14 TEST ITEMS ANALYZED
	66.5% ANSWERED CORRECTLY	31.7% ANSWERED INCORRECTLY	1.9% OMITTED AN ANSWER	
SUGGEST HYPOTHESES	27 MONROE	GRADE 7	23 STUDENTS	25 TEST ITEMS ANALYZED
	58.3% ANSWERED CORRECTLY	38.3% ANSWERED INCORRECTLY	3.5% OMITTED AN ANSWER	
DEFINING SCIENTIFIC PROBLEMS	27 MONROE	GRADE 7	23 STUDENTS	4 TEST ITEMS ANALYZED
	51.1% ANSWERED CORRECTLY	47.8% ANSWERED INCORRECTLY	1.1% OMITTED AN ANSWER	

APPENDIX C (dont.)

APPENDIX A

Determination Of Sample Size

The power of the F test is a function of ϕ', k = number of treatments, n = number of experimental units under each treatment, and alpha = level of significance of the test.

The following formula was used to compute results used for entering the Power function charts:

$$\phi' = \sqrt{\frac{\Sigma(\mu_i - \mu)^2/k}{\sigma^2}}$$

Among the four achievement tests used in the study the S E Meas. which is the greatest was 3.62 raw score units.

Assuming that 2.5 S E Meas. would be considered a practical difference between μ_i and μ, the following computation was completed:

$$\Sigma(\mu_i - \mu)^2/k = \frac{81.9 + 81.9 + 81.9 + 0}{4} = 61.4$$

$$\sqrt{\frac{61.4}{\sigma^2}} = \sqrt{\frac{61.4}{103.8}} = \sqrt{.59} = .768 = \phi'$$

This result indicates a need for eight replications/treatment.

APPENDIX B

STUDENT NAME | GRADE | H.R. | SERIAL | SCHOOL | TEST NAME(S) | DATE TESTED

7 112 167735 029 ¤SCAT-2 $STEP 3A 05/68

TEST RESULTS PROFILE
FORM NO. 329050

TEST PART NAME	RESULTS
¤ VERBAL ABILITY	78%/7
¤¤ MATH ABILITY	82%/7
¤ TOTAL ABILITY	80%/7
$READ ACHIEV	81%/7

PERCENTILE RANK ▶ 00 01 | 02 03 | 04 05 | 06 10 | 12 15 | 18 21 | 25 29 | 33 37 | 42 47 | 52 57 | 62 66 | 70 74 | 78 81 | 84 87 | 89 91 | 93 95 | 96 97 | 98 99

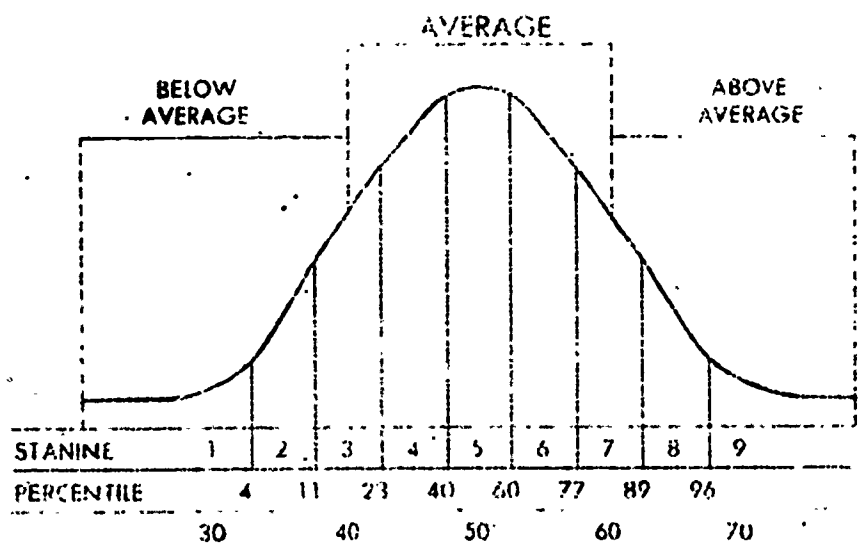
STANINES

THE TEST SCORES ARE ESTIMATES OF TRUE ABILITY & ACHIEVEMENT IN SCHOOL WORK. COMPARE ABILITY & ACHIEVEMENT SCORES TO DETERMINE STRONG &WEAK AREAS.

STANDARD SCORE – USE WITH INTEREST TEST RESULTS ▶ 0-27 | 29 31 | 32 33 | 34 36 | 37 38 | 39 41 | 42 43 | 44 46 | 47 48 | 49 51 | 52 53 | 54 56 | 57 58 | 59 61 | 62 63 | 64 66 | 67 68 | 69 71 | 73

BELOW AVERAGE | AVERAGE | ABOVE AVERAGE

THE SCORE A STUDENT EARNS ON A TEST OR SERIES OF TESTS SHOULD NOT BE CONSIDERED AN EXACT MEASUREMENT BECAUSE A NUMBER OF THINGS MAY INFLUENCE THE SCORE. FOR THAT REASON, SCORES ON TESTS ARE MERELY INDICATORS OF LEARNING OR POTENTIAL TO LEARN.



HOW TO INTERPRET YOUR SCORES –

STANINES: THE STANINE SCORE IS A VALUE IN A SIMPLE NINE POINT SCALE. STANINES RANGE FROM 1 (LOW) TO 9 (HIGH). STANINE SCORES OF 4, 5, AND 6 ARE AVERAGE.

PERCENTILES: PERCENTILES SHOW WHERE A STUDENT'S SCORE RANKS IN COMPARISON TO OTHER CHILDREN IN THAT GRADE. A SCORE OF 40 MEANS THAT SCORE IS HIGHER THAN 40% OF THE STUDENTS IN THAT GRADE.

STANDARD SCORES: THE CENTER SCORE IS PLACED AT 50 WITH EQUAL UNITS OF 10 PLACED EACH DIRECTION FROM THE CENTER. INTEREST TEST SCORES ABOVE 57 SUGGEST A LIKING FOR THAT ACTIVITY. SCORES BELOW 43 SUGGEST POSSIBLE NON-ENJOYMENT.

CONCEPT ANALYSIS

05/68 DATE TESTED

STEP MATHEMATICS FORM 3A

CONCEPT	SCHOOL				
	25 MARSHALL	GRADE 7	31 STUDENTS	9 TEST ITEMS ANALYZED	
PROBABILITY AND STATISTICS		60.6% ANSWERED CORRECTLY	39.4% ANSWERED INCORRECTLY	.0% OMITTED AN ANSWER	
	25 MARSHALL	GRADE 7	31 STUDENTS	4 TEST ITEMS ANALYZED	
LOGIC AND PROOF		59.7% ANSWERED CORRECTLY	40.3% ANSWERED INCORRECTLY	.0% OMITTED AN ANSWER	
	25 MARSHALL	GRADE 7	31 STUDENTS	22 TEST ITEMS ANALYZED	
FUNCTION AND RELATION		60.0% ANSWERED CORRECTLY	39.9% ANSWERED INCORRECTLY	.1% OMITTED AN ANSWER	
	25 MARSHALL	GRADE 7	31 STUDENTS	15 TEST ITEMS ANALYZED	
MEASUREMENT AND GEOMETRY		51.8% ANSWERED CORRECTLY	48.0% ANSWERED INCORRECTLY	.2% OMITTED AN ANSWER	
	25 MARSHALL	GRADE 7	31 STUDENTS	8 TEST ITEMS ANALYZED	
SYMBOLISM		72.6% ANSWERED CORRECTLY	27.0% ANSWERED INCORRECTLY	.4% OMITTED AN ANSWER	
	25 MARSHALL	GRADE 7	31 STUDENTS	8 TEST ITEMS ANALYZED	
NUMBERS AND THEIR OPERATIONS		60.1% ANSWERED CORRECTLY	39.9% ANSWERED INCORRECTLY	.0% OMITTED AN ANSWER	

CONCEPT ANALYSIS

STEP SCIENCE FORM 3A — 05/68 DATE TESTED

CONCEPT	SCHOOL			
REASON QUANTITATIVELY	27 MONROE	GRADE 7	23 STUDENTS	11 TEST ITEMS ANALYZED
	59.3% ANSWERED CORRECTLY	37.2% ANSWERED INCORRECTLY	3.6% OMITTED AN ANSWER	
EVALUATE CRITICALLY	27 MONROE	GRADE 7	23 STUDENTS	5 TEST ITEMS ANALYZED
	64.3% ANSWERED CORRECTLY	32.2% ANSWERED INCORRECTLY	3.5% OMITTED AN ANSWER	
DRAW CONCLUSIONS	27 MONROE	GRADE 7	23 STUDENTS	4 TEST ITEMS ANALYZED
	46.7% ANSWERED CORRECTLY	48.9% ANSWERED INCORRECTLY	4.3% OMITTED AN ANSWER	
SELECT VALID PROCEDURES	27 MONROE	GRADE 7	23 STUDENTS	14 TEST ITEMS ANALYZED
	66.5% ANSWERED CORRECTLY	31.7% ANSWERED INCORRECTLY	1.9% OMITTED AN ANSWER	
SUGGEST HYPOTHESES	27 MONROE	GRADE 7	23 STUDENTS	25 TEST ITEMS ANALYZED
	58.3% ANSWERED CORRECTLY	38.3% ANSWERED INCORRECTLY	3.5% OMITTED AN ANSWER	
DEFINING SCIENTIFIC PROBLEMS	27 MONROE	GRADE 7	23 STUDENTS	4 TEST ITEMS ANALYZED
	51.1% ANSWERED CORRECTLY	47.8% ANSWERED INCORRECTLY	1.1% OMITTED AN ANSWER	

APPENDIX C (cont.)

CONCEPT ANALYSIS

05/68 DATE TESTED

STEP SOCIAL STUDIES FORM 3A

CONCEPT SCHOOL

95 CLAY SOCIAL STUDIES	GRADE 7	29 STUDENTS	5 TEST ITEMS ANALYZED	
UNDERSTANDING INTERDEPENDENCE	61.4% ANSWERED CORRECTLY	38.6% ANSWERED INCORRECTLY	.0% OMITTED AN ANSWER	
95 CLAY SOCIAL STUDIES	GRADE 7	29 STUDENTS	3 TEST ITEMS ANALYZED	
UNDERSTANDING ECONOMIC WANTS	57.5% ANSWERED CORRECTLY	42.5% ANSWERED INCORRECTLY	.0% OMITTED AN ANSWER	
95 CLAY SOCIAL STUDIES	GRADE 7	29 STUDENTS	13 TEST ITEMS ANALYZED	
UNDERSTANDING SOCIETY EFFECTING BEHAVIOR	61.0% ANSWERED CORRECTLY	35.5% ANSWERED INCORRECTLY	3.4% OMITTED AN ANSWER	
95 CLAY SOCIAL STUDIES	GRADE 7	29 STUDENTS	16 TEST ITEMS ANALYZED	
UNDERSTANDING DEMOCRATIC SOCIETY	61.0% ANSWERED CORRECTLY	37.3% ANSWERED INCORRECTLY	1.7% OMITTED AN ANSWER	
95 CLAY SOCIAL STUDIES	GRADE 7	29 STUDENTS	22 TEST ITEMS ANALYZED	
UNDERSTANDING FORCES OF NATURE	63.9% ANSWERED CORRECTLY	34.0% ANSWERED INCORRECTLY	2.0% OMITTED AN ANSWER	
95 CLAY SOCIAL STUDIES	GRADE 7	29 STUDENTS	16 TEST ITEMS ANALYZED	
UNDERSTANDING GEOGRAPHIC ENVIRONMENT	63.6% ANSWERED CORRECTLY	36.4% ANSWERED INCORRECTLY	.0% OMITTED AN ANSWER	
95 CLAY SOCIAL STUDIES	GRADE 7	29 STUDENTS	25 TEST ITEMS ANALYZED	
UNDERSTANDING SOCIAL CHANGE	68.0% ANSWERED CORRECTLY	32.0% ANSWERED INCORRECTLY	.0% OMITTED AN ANSWER	
95 CLAY SOCIAL STUDIES	GRADE 7	29 STUDENTS	52 TEST ITEMS ANALYZED	
DRAW CONCLUSIONS	62.9% ANSWERED CORRECTLY	35.7% ANSWERED INCORRECTLY	1.4% OMITTED AN ANSWER	
95 CLAY SOCIAL STUDIES	GRADE 7	29 STUDENTS	27 TEST ITEMS ANALYZED	
COMPARE DATA	46.7% ANSWERED CORRECTLY	52.1% ANSWERED INCORRECTLY	1.1% OMITTED AN ANSWER	
95 CLAY SOCIAL STUDIES	GRADE 7	29 STUDENTS	1 TEST ITEMS ANALYZED	
DISTINGUISH FACT AND OPINION	51.7% ANSWERED CORRECTLY	48.3% ANSWERED INCORRECTLY	.0% OMITTED AN ANSWER	

CONCEPT ANALYSIS

STEP SOCIAL STUDIES FORM 3A — 05/68 DATE TESTED

CONCEPT	SCHOOL			
	95 CLAY SOCIAL STUDIES	GRADE 7	29 STUDENTS	20 TEST ITEMS ANALYZED
IDENTIFY VALUES	59.7% ANSWERED CORRECTLY	39.3% ANSWERED INCORRECTLY	1.0% OMITTED AN ANSWER	
	95 CLAY SOCIAL STUDIES	GRADE 7	29 STUDENTS	30 TEST ITEMS ANALYZED
IDENTIFY GENERALIZATIONS	65.5% ANSWERED CORRECTLY	34.0% ANSWERED INCORRECTLY	.5% OMITTED AN ANSWER	

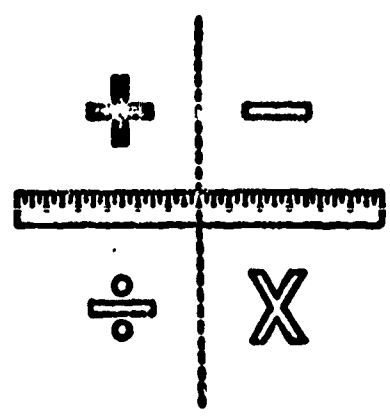
APPENDIX C (cont.)

CONCEPT ANALYSIS

STEP READING FORM 3A — 05/68 DATE TESTED

CONCEPT	SCHOOL			
	29 HUESSEL READING	GRADE 7	28 STUDENTS	15 TEST ITEMS ANALYZED
CRITICIZE CONSTRUCTIVELY		50.5% ANSWERED CORRECTLY	47.1% ANSWERED INCORRECTLY	2.4% OMITTED AN ANSWER
	29 HUESSEL READING	GRADE 7	28 STUDENTS	18 TEST ITEMS ANALYZED
ANALYZE PRESENTATION		43.8% ANSWERED CORRECTLY	54.2% ANSWERED INCORRECTLY	2.0% OMITTED AN ANSWER
	29 HUESSEL READING	GRADE 7	28 STUDENTS	16 TEST ITEMS ANALYZED
REPRODUCE IDEAS		59.4% ANSWERED CORRECTLY	39.1% ANSWERED INCORRECTLY	1.6% OMITTED AN ANSWER
	29 HUESSEL READING	GRADE 7	28 STUDENTS	10 TEST ITEMS ANALYZED
ANALYZE AUTHORS MOTIVATION		52.1% ANSWERED CORRECTLY	45.0% ANSWERED INCORRECTLY	2.9% OMITTED AN ANSWER
	29 HUESSEL READING	GRADE 7	28 STUDENTS	15 TEST ITEMS ANALYZED
TRANSLATE AND MAKE INFERENCES		56.4% ANSWERED CORRECTLY	41.0% ANSWERED INCORRECTLY	2.6% OMITTED AN ANSWER

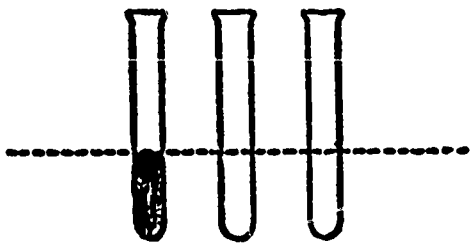
STEP Mathematics



Categories according to which the items were classified by Sheldon S. Myers, ETS

CONCEPT

- NUMBER and OPERATION. Cardinal and ordinal; grouping by ten; bases of number systems; scientific notation by powers of ten; meaning of fractions, decimals, and per cent; kinds of numbers (e.g., integral, rational, irrational, positive, negative, real, complex, even and odd); appropriate arithmetic processes for solving problems; representation of four fundamental processes by manipulation of physical objects; significant digits and rounding off; algorisms; reasonable estimates; approximate numbers; associative, distributive, and commutative laws as applied implicitly in computations.
- SYMBOLISM. Use and nature of symbols, such as %, =, >, <; interpretation of signs of operation, special notation, and algebraic symbolism.
- MEASUREMENT and GEOMETRY. The inverse relationship between the size of a unit and the number of units in a given measurement; significant digits as they apply to precision of measurement; denominate numbers; converting units; spatial estimation; geometric nomenclature; areas and volumes of figures; transformations and invariants; statistics, if thought of as data measurement; different kinds of rates (since they may involve different denominate numbers).
- FUNCTION and RELATION. Graphs; algebraic functions; ratio; proportion; solution of equations; algebraic processes; trigonometric functions; periodicity; mapping and scale drawing; similarity; congruence; inequality.
- PROOF—deductive and inferential reasoning. The logic type of problem involving reasoning about classes or sets; sufficiency of data for a solution; hidden or tacit assumptions in an argument; logical inferences; generalizations from data.
- PROBABILITY and STATISTICS. Extrapolation of graphs depicting trends; prediction of an event on the basis of past performance, or on the basis of opportunities to occur; average (mean); median; correlation; sampling; date interpretation.



STEP Science

Categories according to which the items were classified by Philip G. Johnson, Cornell University, and Frank J. Forsoff, ETS

SKILL

- Ability to identify and DEFINE scientific PROBLEMS. Included in this category is the ability to isolate a problem from a mass of given material and to formulate the problem in a way which allows for systematic solution.
- Ability to SUGGEST or screen HYPOTHESES. Subabilities included here are the abilities to suspend judgment, recognize cause-and-effect relationships, recognize the logical consistency and plausibility of a hypothesis, and check it with relevant laws, facts, operations, or experiments, to select the principle applicable in a given situation.
- Ability to SELECT valid PROCEDURES. This encompasses the design of experiments and the planning required for collection of appropriate data.
- Ability to interpret given information and DRAW CONCLUSIONS. This includes the ability to formulate valid conclusions and to recognize or draw valid generalizations from data known or given.
- Ability to EVALUATE CRITICALLY claims or statements made by others. This encompasses the critical evaluation of advertisements, written materials, and audio-visual materials. Other abilities included are the abilities to detect superstition and fancy, recognize the pseudo-scientific, and avoid unwarranted extrapolations and generalizations; to distinguish fact, hypothesis, and opinion; and to distinguish the relevant from the irrelevant.
- Ability to REASON QUANTITATIVELY and symbolically. Included under this heading are abilities to understand and use numerical operations, symbolic relations, and information presented in graphs, charts, maps, and tables.

STEP Social Studies

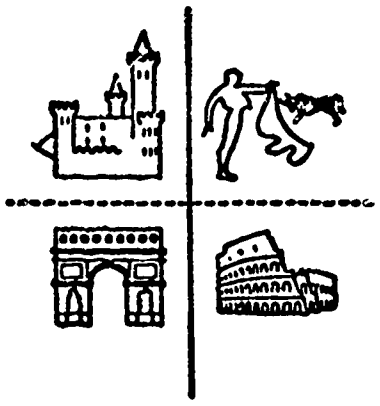
Categories according to which the items were classified by Howard R. Anderson, University of Rochester

UNDERSTANDING

- The nature of SOCIAL CHANGE and its effect on man's ways of living.
- The effects of GEOGRAPHIC ENVIRONMENT on man's ways of living and the institutions he develops.
- Man's increasing control over the FORCES OF NATURE as a major factor in accounting for the ways in which he lives today.
- The nature of DEMOCRATIC SOCIETY and the rights, privileges, and responsibilities of free men.
- The means whereby SOCIETY directs and regulates the BEHAVIOR of its members.
- Man's ECONOMIC WANTS and the ways of satisfying them.
- The INTERDEPENDENCE of individuals, communities, societies, regions, and nations.
- The various ways in which man attempts to UNDERSTAND and explain his ENVIRONMENT and his place in the universe.

SKILL

- IDENTIFY GENERALIZATIONS, main points, and central issues.
- IDENTIFY, compare, and contrast underlying VALUES, attitudes, assumptions, biases, and motives.
- DISTINGUISH FACT from OPINION and propaganda.
- ASSESS the adequacy of DATA with respect to its relevancy, sufficiency, verifiability, and consistency.
- COMPARE and contrast DATA.
- DRAW valid CONCLUSIONS and generalizations.



STEP Reading

Categories according to which the items were classified by Constance M. McCullough, San Francisco State College

SKILL

- Ability to REPRODUCE IDEAS. Comprehending subject-predicate, pronoun-antecedent, modifier-thing modified, and dependent-independent clause relationships; noting frequency of mention; and recalling sequences of ideas or facts.
- Ability to TRANSLATE ideas and MAKE INFERENCES. Identifying ideas found in the passage when they are stated in language different from that of the selection; picking out the main idea; deducing the meaning of figurative, technical, and obscure words, phrases, or sentences; linking ideas to their preceding and following context; applying ideas to new situations; and making specific inferences.
- Ability to ANALYZE MOTIVATION. Analyzing the author's purpose and the attitudes, beliefs, experience, knowledge, etc., which influenced what he said.
- Ability to ANALYZE PRESENTATION. Recognizing and appraising literary devices and forms, "tone," logical structure, and other aspects of the ways selections are written.
- Ability to CRITICIZE. Criticizing constructively the ideas presented, the author's purpose and motivation, and the presentation.

APPENDIX E

Attached to this guide is a list of students who may be in one of your classes. Following each student's name is a series of letters and numbers, each of which is a coded description of that student.

The coding was completed last spring when the students were in the seventh grade, by teachers who had them in class. In every case, the teacher was asked to evaluate the student on nine traits that were observed throughout the year.

The trait names are shown below, following the capital letters. The numerical codes associated with each trait make it possible to describe a student on that trait. (The descriptions approximate an acceptable to non-acceptable rank.)

On the attached list, each student has the teacher's description coded, following the capital letter associated with each trait. All other numbers should be disregarded.

This sample of students with their associated characteristics is provided with the confidence that you will be able to help the student strengthen weaker traits as well as motivate the student through his strongest traits.

Should you not have these students in class, please share this with the teacher in your department who does.

A. Initiative
- 5 — actively creates, lots of initiative
- 4 — frequently initiates
- 3 — occasionally initiates
- 2 — rarely initiates
- 1 — merely conforms

B. Leadership
- 5 — an inspiring leader
- 4 — makes his influence felt
- 3 — leader in certain activities
- 2 — seldom demonstrates leadership
- 1 — not a potential leader

C. Industry
- 5 — zealously seeks additional work
- 4 — interested
- 3 — completes required work
- 2 — needs occasional prodding
- 1 — seldom works even under pressure

D. Emotional Stability
- 5 — exceptionally stable
- 4 — stable under stress
- 3 — good emotional balance
- 2 — shows feelings readily
- 1 — unstable

E. Motivation
- 5 — highly motivated
- 4 — effectively motivated
- 3 — motivation dependent on activity
- 2 — vacillating
- 1 — lacks motivation

F. Common Sense & Judgment
- 5 — excellent insight
- 4 — good judgment
- 3 — some insight
- 2 — little common sense
- 1 — poor judgment

G. Dependability & Responsibility
- 5 — always entirely dependable
- 4 — dependable under stress
- 3 — usually dependable
- 2 — sometimes avoids responsibility
- 1 — not dependable

H. Consideration For Others
- 5 — always considerate
- 4 — generally considerate
- 3 — somewhat considerate
- 2 — indifferent
- 1 — inconsiderate of others

I. Integrity & Honesty
- 5 — completely trustworthy
- 4 — honest under stress
- 3 — usually trustworthy
- 2 — well intentioned but weak
- 1 — untrustworthy

APPENDIX F. CHARACTER RATING PRINTOUT (SAMPLE)

```
107270  STUDENT NAME        208 89 A4.0 B4.0 C5.0 D5.0 E5.0 F5.0 G5.0 H5.0 I5.0  7TH
147545  STUDENT NAME        208 89 A3.0 B3.0 C2.0 D3.0 E3.0 F4.0 G3.0 H3.0 I3.0  7TH
174640  STUDENT NAME        208 89 A3.0 B3.0 C2.0 D3.0 E3.0 F3.0 G2.0 H2.0 I3.0  7TH
304525  STUDENT NAME        208 89 A2.0 B2.0 C1.0 D2.0 E1.0 F2.0 G1.0 H1.0 I2.0  7TH
37150   STUDENT NAME        208 89 A4.0 B4.0 C5.0 D5.0 E5.0 F5.0 G5.0 H5.0 I5.0  7TH
384305  STUDENT NAME        208 89 A4.0 B4.0 C4.0 D5.0 E4.0 F4.0 G5.0 H5.0 I5.0  7TH
390665  STUDENT NAME        208 89 A2.0 B2.0 C4.0 D3.0 E4.0 F3.0 G3.0 H3.0 I3.0  7TH
391540  STUDENT NAME        208 89 A4.0 B4.0 C4.0 D4.0 E4.0 F5.0 G4.0 H4.0 I5.0  7TH
394130  STUDENT NAME        208 89 A4.0 B4.0 C2.0 D3.0 E3.0 F4.0 G3.0 H3.0 I3.0  7TH
440350  STUDENT NAME        208 89 A3.0 B3.0 C3.0 D3.0 E3.0 F3.0 G3.0 H2.0 I3.0  7TH
526370  STUDENT NAME        208 89 A1.0 B1.0 C2.0 D2.0 E2.0 F1.0 G1.0 H2.0 I2.0  7TH
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APPENDIX G

SOUTH BEND COMMUNITY SCHOOL CORPORATION
Division of Instruction
November 30, 1968

TO: Eighth Grade Teachers
FROM: Mr. Gerald Dudley
RE: PREVIEW OF TEST RESULTS

In May, 1968, a small group of 7th grade students in each school was tested using the scholastic ability and achievement tests of the revised testing program. These test results have been used throughout the summer months and during this semester to "de-bug" the computer programs developed for scoring the tests.

With the "de-bugging" completed, the results are ready for your preview and use. In order to be useful to all school personnel who work with these students, the results are reported in several different formats as follows:

1. Pressure Sensitive Test Labels:

   These labels are to be attached to the student's permanent record. The labels present each student's test results in percentile rank and stanine form.

2. Individual Test Results Profile:

   This unique reporting form presents each student's test results as well as geometrically plotting the results for visual comparison. The reverse side of the profile provides a guide for interpretation.

3. Concept Analysis:

   This report provides an analysis of student responses to groups of achievement test questions. The questions are grouped around the major concept they measure. Results show the number of students tested, the number of test items grouped under the concept, the percent answered correctly, the percent answered incorrectly, and the percent not answered.

4. Frequency Distribution:

   This report summarizes the test results of all students in a school. Included are the means, medians, quartiles, and standard deviations.

Samples of one or more of the last three formats are included for your use. They are provided with the confidence that you will be able to use these results in the instruction of these students.

APPENDIX G
(cont.)

PREVIEW OF TEST RESULTS
November 30, 1966

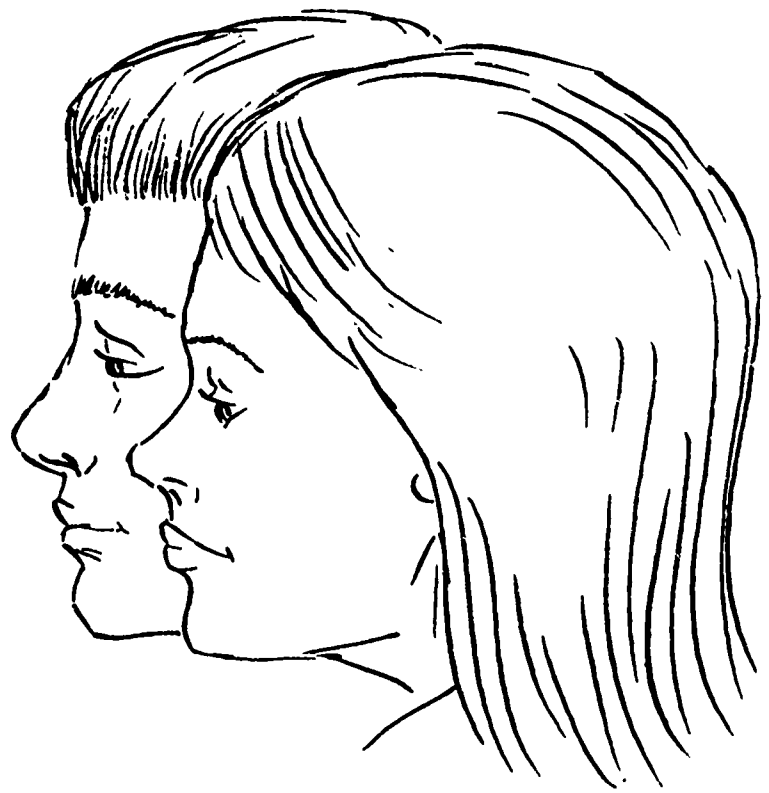
The Profile gives you a method of comparing the verbal and mathematical abilities of a student with his total ability to do school work. This may also be compared to the results of achievement testing. This type of analysis may provide clues to whether the student is working up to his potential.

The Concept Analysis gives you a method of determining the major areas of understanding your students have in the achievement area tested. This may give you a teaching guideline for emphasis of certain concepts.

Your principal may want to discuss the distribution of student test results with you as presented in the Frequency Distribution for all students in the school. This distribution may help provide a basis for the level of instruction you use with the students tested.

It is possible that you may not have all of these students in your class. If this is the case, please share the results with other teachers in your department.

Forecasting For Success



This Booklet is the personal PROPERTY OF: _____

KEEP ME HANDY!!!

THIS BOCKLET IS YOUR PROPERTY

It is yours to keep and use as you progress through school. Only a limited number has been prepared and made available to students in South Bend, so if you misplace yours, it cannot be replaced.

This booklet has been written as an aid to help you make the decisions normally faced by eighth-grade students.

The facts presented are intended to help you in your never-ending task of making choices. These facts should be helpful to all students, but the way in which you use them is a highly personal matter. Every student will interpret them differently and in light of his own personal experiences and goals. You should, therefore, use this booklet as one resource in making educational decisions.

The data have been gathered from several sources:

1. The school records of students who are still in South Bend Schools.
2. Follow-up information of high school graduates from 1959 through 1967.
3. Follow-up information of students who dropped out of school before graduating.
4. Your own standardized test results.
5. Currently published national statistics.

Why not scan this booklet first and then take it home for your parents to see also!

BUT DON'T LOSE IT

BEFORE YOU USE IT !

Part I

A GLANCE AT THE PAST

The weatherman normally concludes his nightly broadcast by predicting whether or not the area is due for precipitation. He does this by stating the percentage chance of precipitation as follows: (for example) "Chances are 8 out of 10 or 80% that rain will fall in South Bend in the next 12 hours." How is he able to make predictions of weather conditions? He has records which show what the weather is likely to be if certain conditions are present. Past records show that with weather conditions similar to todays, it rained about 80% of the time.

Human beings are also creatures of habit and therefore tend to continue doing things in a similar manner when given the same task to accomplish. If we kept a record of the past we could predict, with some certainty, the likely chances of completing certain school tasks or the grades which would be received.

That is what the first part of this booklet is all about. It provides the past records of students like you in South Bend schools and shows the grades they achieved in eighth grade courses.

These grades of students are presented in a manner that should allow you to look at your own past record and predict the kind of grades you are likely to receive in eighth grade courses.

You may be thinking, "Why are the past grades of students important in predicting future grades?" Studies have shown that the best single predictor of how well a student will do in the future is how well he did in the past.

In some instances it might be nice not to have to look at grades, particularly if yours aren't what you wish they were, but if you want to change them this

year you need to know what the odds are. **AND YOU COULD BE THE ONE TO CHANGE THE ODDS!**

This information about grades is reported in a form called Experience Tables. That is, they are the experience of students who have completed both the seventh and eighth grades in South Bend schools.

A. Reading An Experience Table

In this booklet the numbers in the experience tables are ratios. They are the ratios of the number of students who earned a certain year-end grade in the eighth grade, having first received a certain year-end grade in the seventh.

For example: the number 1 stands for one out of every 10 students; the number 2 stands for 2 out of every 10 students; the number 3 stands for 3 out of every 10 students. A minus (-) sign means less than one out of ten.

Below is an example of an experience table showing the average grades earned by students as they entered into your present eighth grade.

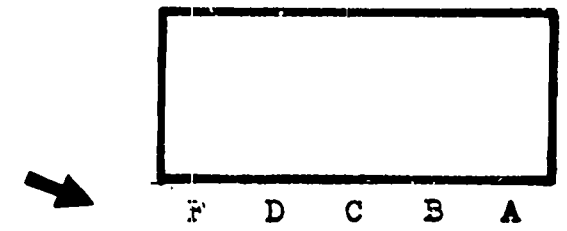
GRADES EARNED BY FORMER STUDENTS

Average 8th grade grades	F	D	C	B	A
A	0	0	0	-	6
B	0	0	2	5	3
C	0	3	5	4	1
D	3	5	3	1	0
F	7	2	-	0	0

Average 7th grade grades

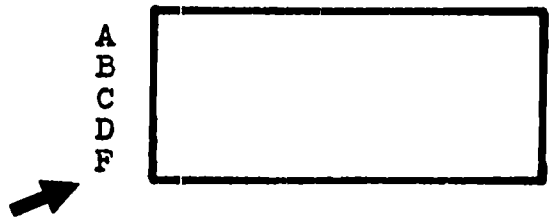
Experience Table

At the bottom of the experience table are the seventh grade averages.



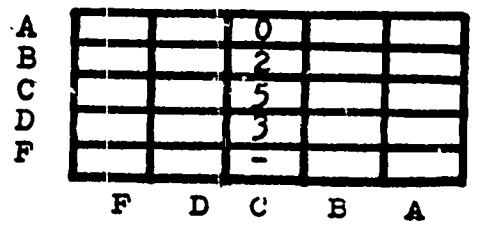
Experience Table

Along the side of the experience table are the average grades earned in the eighth grade.



Suppose you were a "C" student in the seventh grade:

1. First find the "C" column at the bottom of the table.
2. Read up from the bottom then across to the side.



3. You see that 5 out of every 10 students or 50% with your seventh grade average earned a "C" average in the eighth grade.
4. You also find that:

(fill in)

____out of 10 earned A
____out of 10 earned B
____out of 10 earned D
____out of 10 earned F

Some students raise their average in the eighth grade and some lower their average. Will you lower or raise your grades? This depends a lot on choices - choices only <u>you</u> can make.

You have a record from the past year and can match that with the experience tables that follow. You will be similar to the weatherman by being able to predict the grades you may receive. However, there is a big difference between you and the weatherman. He has no control over the weather. You have some control over your school life. You are in a position to choose how <u>similar</u> or <u>different</u> you want to be from the students in the experience tables.

REMEMBER, THESE TABLES ARE FROM THE ACTUAL RECORD OF STUDENTS STILL IN SOUTH BEND SCHOOLS.

B. <u>Experience</u> Tables

1. Grades earned in <u>English</u> courses

8th grade	F	D	C	B	A
A	0	0	-	1	7
B	0	-	2	5	3
C	1	3	6	3	-
D	4	5	2	-	C
F	5	1	-	-	0

7th grade

Using the table above. for students who entered the 8th grade with my 7th grade English record:

_____out of 10 earned A
_____out of 10 earned B
_____out of 10 earned C
_____out of 10 earned D
_____out of 10 earned F

For students who entered eighth grade with my 7th grade English average:

_____out of 10 raised their English grade
(add the numbers <u>above</u> the shaded square)
_____out of 10 earned the same grade
_____out of 10 lowered their English grade
(add the numbers <u>below</u> the shaded square)

Study this first of several experience tables carefully. Should you have questions about it or the ones that follow, please contact your counselor for assistance.

For the following experience tables, try to answer the same questions as the ones presented after the English experience table.

2. Grades earned in <u>mathematics</u> courses

8th grade	F	D	C	B	A
A	0	0	-	1	6
B	-	-	2	6	4
C	2	3	5	3	-
D	6	5	2	-	0
F	2	2	-	0	0

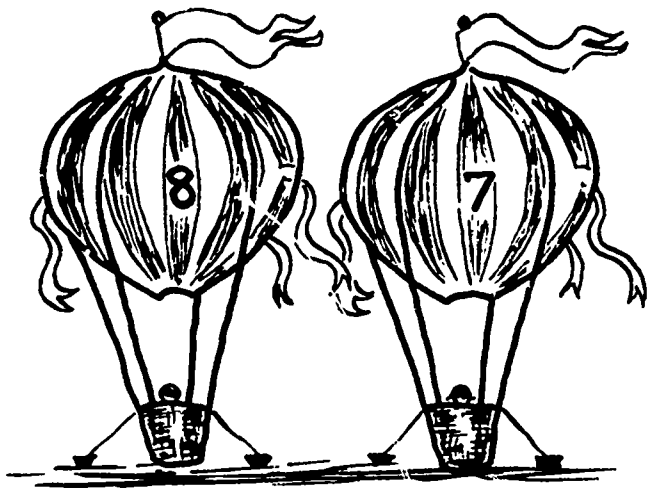
7th grade

3. Grades earned in <u>science</u> courses

8th grade	F	D	C	B	A
A	0	0	-	2	5
B	0	-	2	3	4
C	-	3	6	3	1
D	5	6	2	-	0
F	4	1	-	0	0

7th grade

Are you sure you studied those last two experience tables thoroughly? If you would have received a failing grade in the 7th grade in either course (mathematics or science), are your chances better than average or less than average to receive a passing grade (D or better) this year?



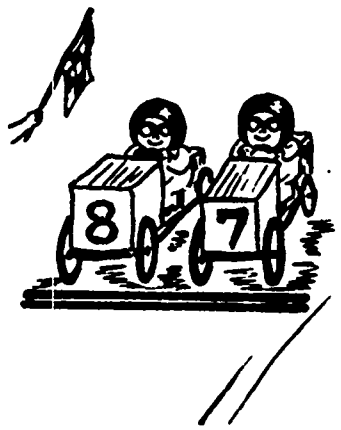
4. Grades earned in <u>social studies</u> courses

8th grade	F	D	C	B	A
A	0	0	-	2	7
B	0	-	2	4	2
C	1	4	5	3	-
D	5	4	3	-	-
F	4	1	-	0	0

7th grade

If you didn't answer that last question "better than average" you should review the examples stating how experience tables are made and used. Only 2 out of 10 students failing 7th grade mathematics courses failed it in the 8th grade. Likewise, more than 5 out of 10 who had failed 7th grade science passed it in the 8th grade.

The next two experience tables may or may not be used by you, depending on whether or not these courses are being taken by you.



5. Grades earned in shop courses

8th grade

7th grade	F	D	C	B	A
A	0	0	-	1	6
B	0	1	3	6	3
C	3	4	5	3	1
D	3	4	1	-	0
F	3	1	-	0	0

6. Grades earned in home economics courses

8th grade

7th grade	F	D	C	B	A
A	0	0	-	2	7
B	0	-	4	5	3
C	10	3	5	2	0
D	0	6	1	-	0
F	0	0	-	0	0

Knowing what my earned grades were in the seventh grade, the grades I can safely predict for myself this eighth grade are:

English _____
Mathematics _____
Science _____
Social studies _____
Shop _____
Home economics _____

(fill in your estimates now)

Part II

STANDARDIZED TEST RESULTS -- AN OUTSIDE OPINION

In Part I of this booklet you had an opportunity to see how students similar to you performed in eighth grade courses. You were able to compare your past grades with theirs and predict how you may do in the eighth grade.

This part of the booklet will show you how you may compare your school ability and knowledge with students from all parts of the United States.

You may remember last May that one of your teachers gave you and your classmates an opportunity to measure both your school ability and subject knowledge by means of standardized tests.

The test measuring your ability to do school work is known as the School and College Ability tests, Series II. Your results show your Verbal Ability, Mathematics Ability, and Total Ability in comparison with a sample of students in your age and grade level across the Nation. In a way, these results are also a prediction of how well you might expect to perform in school work.

This prediction is based upon National rather than local information.

A test measuring the knowledge you have gained so far in a specific school course was the second type of standardized test your teacher gave you. This test was one of a series known as the Sequential Tests of Educational Progress. The results of your performance are compared with students of your age and grade level from across the country.

During the summer these comparisons were made by means of a computer and the results have been printed in a form that should make them easy to understand.

The following space has been provided so that you can attach your copy of the Test Results Profile permanently.

It is important to be able to read the back side of the Profile to help you in its interpretation. Should you need further assistance, please consult your counselor or teacher.

As an aid to interpreting your tests results, complete the following:

.....My percentile rank score for Total Ability was _____which indicates my school ability score is equal to or higher than _____% of the students in the National sample.

.....Do my verbal ability and my mathematical ability appear to be similar or is one higher than the other? Which one appears higher? _____

.....My test results on the three parts of the ability tests appear to be (underline one) - below average - average - above average.

.....My Achievement test results indicate (underline one) below average - average - above average knowledge of that subject.

.....Do the results of the ability test and the achievement test seem to be in line with each other? If not, what reasons could you give for their difference? _____

_____

_____

_____

.....It is

.....It is important to remember that these test scores are an independent judgment of my ability and achievement in school work. Do the results seem to be in line with my actual performance in school work in the past years? If not, why not? _____

_____

_____

_____

.....COMBINING THIS ADDED INFORMATION with my grade prediction from Part I of this booklet, I would predict my ability to do school work to be_____

_____

_____

_____

Part III

A LOOK BEYOND THE EIGHTH GRADE

The facts presented in this part are the findings of what happened to students who are no longer in South Bend schools. The reports are about TWO different GROUPS. The first group represents all those who have graduated from high schools in South Bend. The second group represents all those who left school before graduating and may be called dropouts.

Looking this far into the future may seem like going too far, but the facts may help you plan more realistically. You have need for this information for two reasons. First, you will begin to plan your school program during your eighth grade. Second, within a few years you will be 16 years old--the legal age for quitting school, should you desire.

AFTER LOOKING AT THE FINDINGS IN THIS PART, ASK YOURSELF IF THIS LOOK INTO THE FUTURE IS NOT REALLY A LOOK AT YOU TODAY?

1. The High School Graduate

Each year as a new school year begins, those who graduated in the spring are contacted and asked where they are and what they are doing. Graduates have been responding in this way at least as far back as 1956. As you may well imagine, there has been a steady increase in those who continue in formal education, once graduated.

The last four years reports should represent current trends in where graduates go and what they do, at least during their first year after graduation.

First Year Activities Of South Bend Graduates

...About 42% enter colleges and universities.
Of that number, approximately 80% enter colleges in Indiana.

...About 13% enter other types of schools.
These include technical, trade, beauty, and barber schools, etc.

...About 32% enter directly into an occupation.

...About 4 to 7% enter military service.
As you might imagine, this percent has increased recently.

...About 2 to 3% are housewives and not working outside the home.

...Approximately 2% are unemployed on the date they are contacted.

...The remaining 1 to 5% could not be located.

So far in this part you have seen how South Bend graduates probably faced the same kinds of questions you may be asking yourself today.

Such questions as:

★ Where am I going?

★ What is really important to me now--later?

★ How can I get there?

Some of the facts you are studying may help you think more clearly about these questions.

A great deal of information has been gathered from the second group--the dropouts--and is summarized as follows:

2. The Dropout

It seems to be well known that dropping out of school is not a very realistic thing for most persons to do, but each year about 600 students leave South Bend schools with the intention of not returning to graduate.

Records have been kept on students from this group as well as the graduating group and a recent study of these two groups showed that in certain ways the dropout was different from the graduate. In fact, the differences were great enough that it is possible to predict with a great deal of certainty those who may be dropouts.

Here is a little test which you can complete. It was developed from the study mentioned above and separates the graduate from the dropout. In order to complete the test you have to know the answers to 7 questions:

a) How would you classify your father's occupation? (This may take some study of the scientific classification of all occupations).

b) How many years of school were completed by your mother?

c) How do you get along with your classmates?

d) How do you rank with relation to your classmates in grades you receive in school?

e) How many times have you failed a grade?

f) How many schools have you transferred to? (Not counting the move from elementary to junior high because both were not in the same building).

g) How many other children are there in your family?

Once you have the answers to these questions you are ready to begin. Each line in the following test has several boxes after it. Place an X in the box that best answers the question. Do this for each of the 7 questions, placing only one X on each line. At the top of all boxes you will see there are a series of positive and negative numbers. Each one of your seven X's is directly beneath one of these numbers. Record the number corresponding to each X by placing it in the space provided to the right side of each question. Now, total the seven numbers you recorded. This total number is your score and should be somewhere between +13 and -9.

Past studies of South Bend students, using this short test, have shown that those students who have positive scores (that is, their total score is between +1 and +13) are considered to have scores similar to students who dropped out of school. The same studies show that negative scores (from 0 to -9) are more likely to be received by students who graduate from high school.

	+3	+1	0	-1	-3	SCORE
1. Father's occupation?	unskilled	semi-skilled	sales agriculture clerical technical	service	skilled professional managerial	
2. Mother's education	grade 9 or less		completed grade 10 or 11	High S. or higher		
3. Classmates acceptance?	just tolerated or avoided		accepted		sought out	
4. Class rank?		50% or lower	between 50% and 75%	upper 25%		
5. Grade failures?		1 or more	none			
6. School transfers?		2 or more		less than 2		
7. Brothers & sisters?		4 or more	3 or less			
					Total score	

The test you just completed is the end result of a study of South Bend students using many more than these final seven factors. None of the other factors was able to predict either dropouts or graduates from a large group of both. For your information, some of the other factors considered were: school ability, ability to read, attendance, family income, parents marital status, age, church preference, and many other available facts.

To show you how well this test predicts dropouts and graduates, let's look at an experience table similar to those used in Part I.

Experience Table

	+1 to +13	0 to -9
Graduated →	1	7
Dropped out →	9	3

Total Test Score

You should find that:

(fill in) ____out of 10 students with a score similar to mine graduated from high school.

____out of 10 students with a score similar to mine dropped out before graduating.

If you look back at the questions in the test you will see that most of them are factors that may be completely out of your control or in your past.

You may be able to make changes in two of the factors. Which two do you think you can change?

_____ _____

If you desire to change, perhaps you may want to discuss it with your counselor, teacher, etc., who might suggest ways to bring about a change.

Do any of the facts about graduates or dropouts surprise you? Which ones? _____

As I think about it now, when I graduate from high school I hope to _____

_____

_____

Each year the United States Labor Department gathers facts from the experience of workers and places a $ value on education. The August 1968 figures show that lifetime earnings of a high school dropout are 12% higher than an eighth-grade graduate, a high school graduate earns 15% more than a high school dropout, and a college graduate earns 42% more than a high school graduate.

If the lifetime earnings of an eighth-grade graduate were $100,000.00, the earnings of a dropout would be _____. The earnings of a high school graduate would be _____ and the lifetime wages of a college graduate would be _____.

Part IV

THE FUTURE IS YOURS, BUT IT STARTS TODAY

So far you have studied what happened to former students like you in both South Bend schools and across this Nation. The term "like you" meant that they entered the eighth grade with your seventh grade record. Do you remember why your seventh grade record was important to know? _____

_____

_____

_____

The experience tables in this booklet showed how many out of every ten students like you earned certain grades in eighth grade courses as well as what happened to them in later years. In what ways might this information help in planning <u>your</u> future? _____

_____

_____

_____

In what way might this information <u>not</u> forecast your future? _____

_____

_____

_____

Already one important difference is seen between you and former students like you.

YOU NOW HAVE SOME SPECIFIC FACTS ON WHICH TO BASE YOUR CHOICES.

<u>Could you be mistaken</u>?

You have had little time to study this booklet and it is easy to get wrong impressions. If you have any of the following impressions, pause and review more carefully.

- ☆ The facts in this booklet may apply to other students but not to me.
- ☆ My success depends on whether I get good grades.
- ☆ Those who choose college will be more successful than those who choose to work after graduation or go to a technical school.
- ☆ If I enter college, the future will take care of itself.
- ☆ I need to know specifically what kind of a job I want in the future in order to make wise decisions now.
- ☆ It is easy for me to judge how successful other students are.
- ☆ Experience tables predict what will happen to me.
- ☆ To be realistic, I should choose what former students with my grade average did.
- ☆ Whatever I decide to do after high school, that decision is final.
- ☆ I should make all my decisions alone without talking to my parents or counselor.
- ☆ My standardized test scores would not change should I re-take the tests.

Risk taking and decision making

Every decision you make involves a risk. As you have seen, the Experience Tables and other facts pro-

vide a way of judging the "risks" a student takes when deciding upon any one choice. However, we have no evidence at all that the "best" choice is the "safest" choice; it might be the choice with the least degree of "safeness".

Research would show that a good decision is one in which the student is well informed about alternatives open to him or her and uses a well considered process for making the decision.

This same research indicates the following considerations are important to you when thinking about choices available to you:

1) The level of risk depends upon what you are risking--an opinion, some money, a chance of success on a test or in a job, or a life goal.

2) Very fearful persons tend to take either very great or very low risks, while persons who enjoy challenging themselves tend to take intermediate risks.

3) Knowledge of the probability of success sometimes changes your goal when success seems "risky". However, some students succeed even with low probability for success.

4) Each student probably has some important individual differences in being ready to take risks.

5) A person's level in school or the kind of community he comes from probably influences his willingness to take a risk.

JUST ONE FINAL CONSIDERATION

Do you want an F grade? THEN...

Do less than is required.
Don't pay attention in class.
Leave your materials somewhere else.
Hand in work late or not at all.
Be tardy to class and absent often.
Never make up missed work.
Learn little about the subject.
Make very slow progress.

Do you want a D grade? THEN...

Usually do what is required.
Often leave materials somewhere else.
Often "misunderstand" assignments.
Be careless in completing assignments.
Often be late with work.
Attend class irregularly.
Sometimes make up missed work.
Learn just enough to cover minimum assignments.
Do little or no supplementary work.
Make slow progress.

Do you want a C grade? THEN...

Do all that is required, but no more.
Be attentive in class.
Be reasonable thorough and prompt.
Work with average neatness and accuracy.
Hand in work on time.
Make up all work missed.
Meet the teacher's minimum requirements.
Do some extra work on your own.
Make steady and noticeable progress.

Do you want a B grade? THEN...

Do all that is required of a C grade and
Gain and use a widened vocabulary.
Do much extra work on your own.
Learn to accept criticism and improve on it.
Gain above average knowledge of school subjects.
Make rapid progress.

Do you want an A grade? THEN...

Do all that is required of a B grade, and
Always take part in class discussions.
Learn to give good recitations with no teacher aid.
Gain superior knowledge of the subject.
Show an ability to use knowledge.
Progress so rapidly that you become an outstanding member of the group.

Today some 2800 eighth-grade students in South Bend will go with you through the next five years of this adventure called "learning." Each student will choose how he views his school, his teachers, his classmates, and himself along the way. You have come to realize that the schools can not give you an education. They can only offer you the opportunity to get an education--the opportunity to make the vital choice:

TO LEARN

OR NOT

TO LEARN...

APPENDIX I

NON-ACADEMIC EVALUATION CARD

SERIAL | STUDENT NAME | SUBJECT TEACHER | PERIOD | SUBJECT | SUBJECT CODE

SCHOOL | HOME ROOM | GRADE | | TEACHER CODE

NON-ACADEMIC EVALUATION CARD

USE AN ELECTROGRAPHIC PENCIL ONLY.

Please handle this card **CAREFULLY** *and* **CONFIDENTIALLY.**

Keep as clean as possible, do not fold or bend the corners, and make no marks on it except in the ⊂ ⊃.

BLACKEN *completely only one* ⊂ ⊃ *under* **each** *column heading.*

	Initiative	Leadership	Industry	Emotional Stability	Motivation	Common Sense & Judgment	Dependability & Responsibility	Consideration For Others	Integrity & Honesty
0	actively creates, lots of initiative	an inspiring leader	zealously seeks additional work	exceptionally stable	highly motivated	excellent insight	always entirely dependable	always considerate	completely trustworthy
0-1	⊂5⊃	⊂5⊃	⊂5⊃	⊂5⊃	⊂5⊃	⊂5⊃	⊂5⊃	⊂5⊃	⊂5⊃
1	frequently initiates	makes his influence felt	interested	stable under stress	effectively motivated	good judgment	dependable under stress	generally considerate	honest under stress
2	⊂4⊃	⊂4⊃	⊂4⊃	⊂4⊃	⊂4⊃	⊂4⊃	⊂4⊃	⊂4⊃	⊂4⊃
3	occasionally initiates	leader in certain activities	completes required work	good emotional balance	motivation dependent on activity	some insight	usually dependable	somewhat considerate	usually trustworthy
4	⊂3⊃	⊂3⊃	⊂3⊃	⊂3⊃	⊂3⊃	⊂3⊃	⊂3⊃	⊂3⊃	⊂3⊃
5	rarely initiates	seldom demonstrates leadership	needs occasional prodding	shows feelings readily	vacillating	little common sense	sometimes avoids responsibility	indifferent	well intentioned but weak
6	⊂2⊃	⊂2⊃	⊂2⊃	⊂2⊃	⊂2⊃	⊂2⊃	⊂2⊃	⊂2⊃	⊂2⊃
7	merely conforms	not a potential leader	seldom works even under pressure	unstable	lacks motivation	poor judgment	not dependable	inconsiderate of others	untrustworthy
8	⊂1⊃	⊂1⊃	⊂1⊃	⊂1⊃	⊂1⊃	⊂1⊃	⊂1⊃	⊂1⊃	⊂1⊃
9									

1 2 3 4 5 6 SERIAL | 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 STUDENT NAME | 28 | 29 30 31 | 32 33 34 HOME ROOM | 35 36 37 38 39 40 41 42 43 44 SUBJECT | 45 46 47 48 49 50 51 52 53 54 SUBJECT TEACHER | 55 56 TEACHER CODE | 57 58 59 | 60 | 61 62 63 SUBJECT CODE | 64 65 66 67 68 69 70 | 71 72 73 74 75 76 77 78 79 80 EVALUATIONS

SOUTH BEND COMMUNITY SCHOOLS

IBM 822039

APPENDIX J

Results Of A Study To Determine The Rater-Reliability With The Non-Academic Rating Card

Each year all students in two grade levels of the high schools of South Bend are rated by their subject teachers on the nin character trait ratings of the Non-Academic Rating Card.

A study to determine the reliability of the instrument utilizing independent judges was conducted as follows:

From the data bank of approximately 5,000 students rated during the 1969-70 school year, a total of ten students was selected at random. The separate ratings provided on each student may have been made by a unique group of judges. Also, since some students have four subject teachers and others have more, the number of raters varied with each student.

An estimate of rater reliability was obtained through an analysis of variance procedure (Winer, 1962, P. 131) for eacn subject. The estimates of reliability were given by

$$r = \frac{MS_{\text{between items}} - MS_{\text{residual}}}{MS_{\text{between items}}}$$

Using this formula the frames of reference of each of the judges was not considered a part of the error of measurement but a systematic variation due to teacher-student interaction.

The following reliabilities were the result

Student	No. of raters	Reliability
1	5	.657
2	5	.823
3	4	.742
4	6	.903
5	6	.749
6	5	.264
7	5	.847
8	5	.863
9	5	.790
10	5	.750

With the exception of student 6, the reliabilities estimated in the study are within the expected range of estimates of internal consistency. Reliabilities in the range produced above would be considered adequate for rating scales of this type.

APPENDIX K

SOUTH BEND COMMUNITY SCHOOL CORPORATION
Instruction Department
November 1, 1968

TO: Counselors of Junior High Students

RE: Test and Data Interpretation

The following students have been randomly selected to receive the FORECASTING FOR SUCCESS workbook.

Please meet each student in a group session and an individual interview to discuss the workbook. Encourage use of the workbook in planning for better school work and encourage taking it home for family discussion.

Record below the date you meet with each student in both group and individual session.

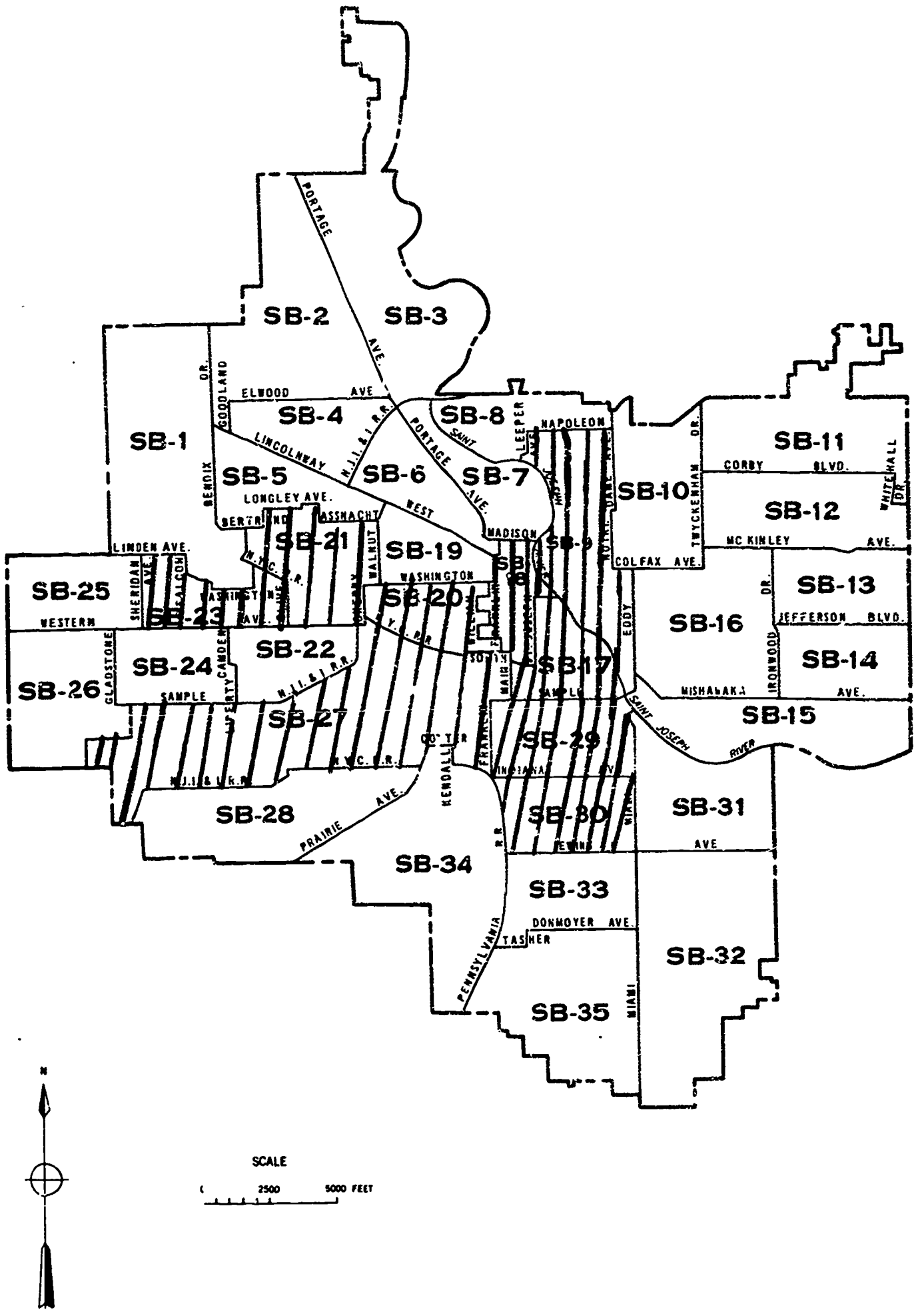
When complete, return to: GUIDANCE DEPT., ADMINISTRATION BLDG.

NAME	GROUP	INDIVIDUAL	NAME	GROUP	INDIVIDUAL

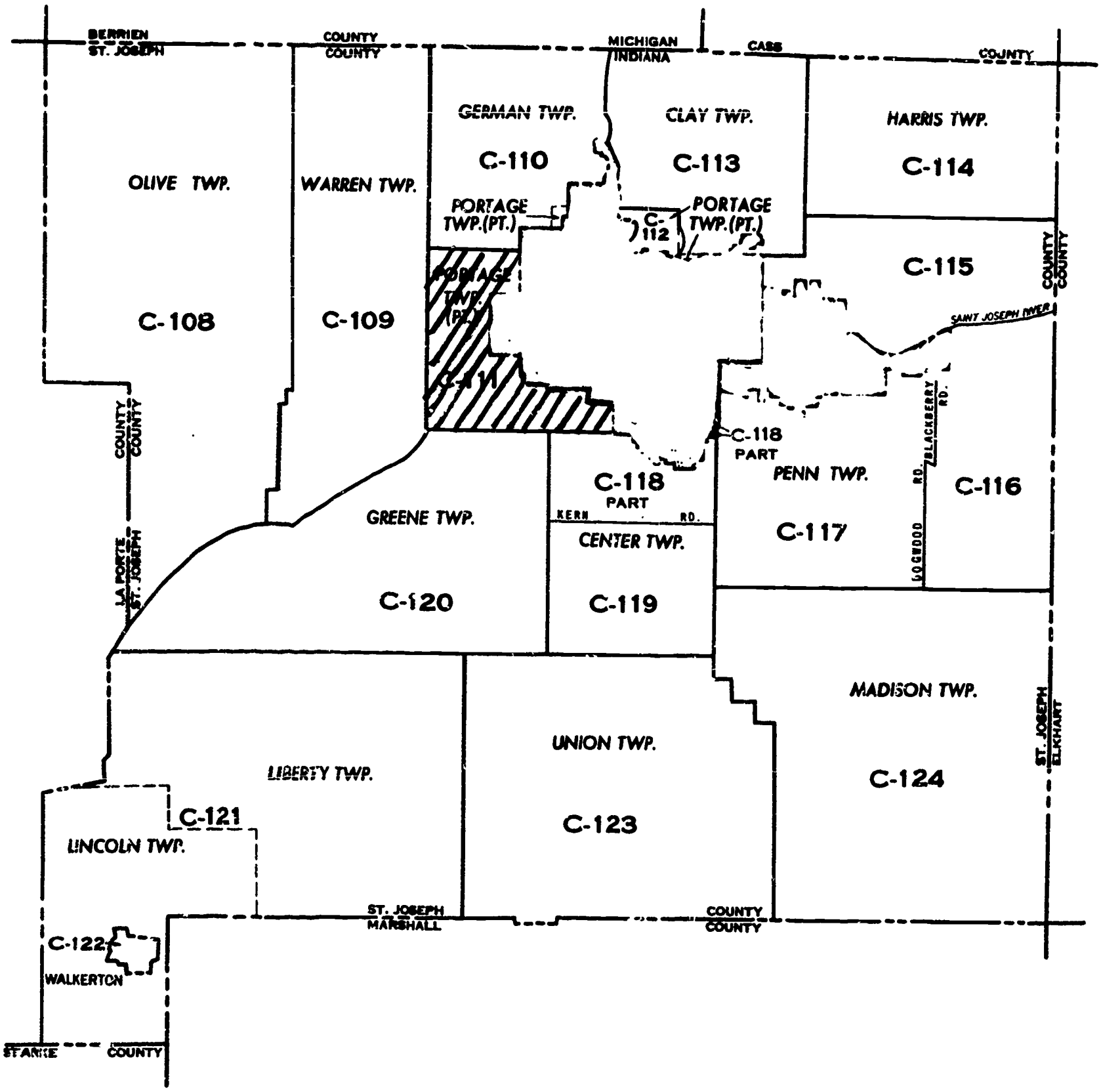
APPENDIX L

CENSUS TRACTS IN THE SOUTH BEND SMSA

INSET A - SOUTH BEND CITY



CENSUS TRACTS IN THE SOUTH BEND SMSA



SCALE

0 1 2 3 4 5 MILES

N

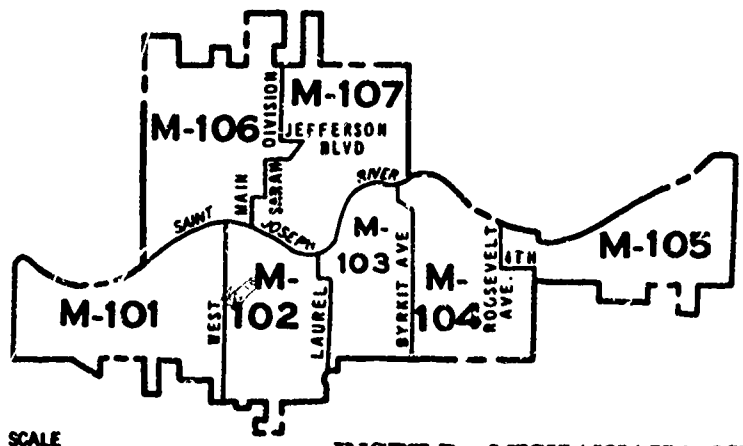
BOUNDARY SYMBOLS

Census Tract Boundaries:

- State Line
- County Line
- Corporate Limit Line
- Minor Civil Division Line
- Other Tract Lines

Boundaries Which Are Not Tract Lines:

- Minor Civil Division Line



SCALE

0 2500 5000 FEET

INSET B - MISHAWAKA CITY

APPENDIX M

Local Conversion Tables - Raw to Z to T scores

SCAT II, Verbal, and Mathematics Scores

Raw Score	Verbal		Mathematics	
	Z	T	Z	T
6	-2.60	240		
7	-2.50	250		
8	-2.35	265		
9	-2.25	275	-2.60	240
10	-2.15	285	-2.50	250
11	-2.00	300	-2.35	265
12	-1.90	310		
13	-1.80	320	-2.10	290
14	-1.65	335	-2.00	300
15	-1.55	345	-1.85	315
16	-1.45	355	-1.75	325
17	-1.35	365	-1.65	335
18	-1.20	380	-1.50	350
19	-1.10	390	-1.40	360
20	-1.00	400	-1.25	375
21	- .85	415	-1.15	385
22	- .75	425	-1.00	400
23	- .65	435	- .90	410
24	- .55	445	- .75	425
25	- .40	460	- .65	435
26	- .30	470	- .55	445
27	- .20	480	- .40	460
28	- .05	495	- .30	470
29	.05	505	- .15	485
30	.15	515	- .05	495
31	.30	530	.10	510
32	.40	540	.20	520
33	.50	550	.35	535
35	.75	575	.55	555
36	.85	585	.70	570
37	.95	595	.80	580
38	1.10	610	.95	595
39	1.20	620	1.05	605
40	1.30	630	1.20	620
41	1.40	640	1.30	630
42	1.55	655	1.45	645
43	1.65	665	1.55	655
44	1.75	675	1.70	670
45	1.90	690	1.80	680
46	2.00	700	1.90	690
47	2.10	710	2.05	705
48	2.25	725	2.15	715
49	2.35	735		

SCAT II Total Scores

Raw Score	Z	T	Raw Score	Z	T
19	-2.55	245	57	- .10	490
20	-2.50	250	58	- .05	495
21	-2.40	260	59	.00	500
23	-2.30	270	60	.05	505
25	-2.15	285	61	.15	515
26	-2.10	290	62	.20	520
27	-2.05	295	63	.25	525
28	-1.95	305	64	.35	535
29	-1.90	310	65	.40	540
30	-1.85	315	66	.45	545
32	-1.70	330	67	.50	550
33	-1.65	335	68	.60	560
34	-1.60	340	69	.65	565
35	-1.55	345	70	.70	570
36	-1.45	355	71	.75	575
37	-1.40	360	72	.85	585
38	-1.35	365	73	.90	590
39	-1.25	375	74	.95	595
40	-1.20	380	75	1.05	605
41	-1.15	385	76	1.10	610
42	-1.10	390	77	1.15	615
43	-1.00	400	78	1.20	620
44	- .95	405	79	1.30	630
45	- .90	410	80	1.35	635
46	- .80	420	81	1.40	640
47	- .75	425	82	1.45	645
48	- .70	430	83	1.55	655
49	- .65	435	84	1.60	660
50	- .55	445	85	1.65	665
51	- .50	450	86	1.75	675
52	- .45	445	87	1.80	680
53	- .40	460	88	1.85	685
54	- .30	470	89	1.90	690
55	- .25	475	90	2.00	700
56	- .20	480	91	2.05	705

APPENDIX M CON'T.

STEP Achievement Tests

Math Pre Test			Math Mid Test			Math Post Test		
Raw	T	Z	Raw	T+	Z	Raw	T+	Z
						8	250	
11	350	-1.70	6	240	-2.60	13	310	-1.90
12	340	-1.60	8	265	-2.35	14	325	-1.75
14	365	-1.35	10	285	-2.15	15	335	-1.65
15	380	-1.20	12	310	-1.90	16	345	-1.55
16	390	-1.10	14	335	-1.65	17	360	-1.40
17	405	- .95	15	350	-1.50	18	370	-1.30
18	415	- .85	17	375	-1.25	19	385	-1.15
19	430	- .70	18	385	-1.15	20	395	-1.05
20	440	- .60	19	395	-1.05	21	405	- .95
21	455	- .45	20	410	- .90	22	420	- .80
22	465	- .35	21	420	- .80	23	430	- .70
23	480	- .20	22	435	- .65	24	440	- .60
24	490	- .10	23	445	- .55	25	455	- .45
25	500	.00	24	460	- .40	26	465	- .35
26	515	.15	25	470	- .30	27	475	- .25
27	525	.25	26	485	- .15	28	490	- .10
28	540	.40	27	495	- .05	29	500	0.00
29	550	.50	28	505	.05	30	515	.15
30	565	.65	29	520	.20	31	525	.25
31	575	.75	30	530	.30	32	535	.35
32	590	.90	31	545	.45	33	550	.50
33	600	1.00	32	555	.55	34	560	.60
34	615	1.15	33	570	.70	35	570	.70
35	625	1.25	34	580	.80	36	585	.85
36	640	1.40	35	595	.95	37	595	.95
37	650	1.50	36	605	1.05	38	610	1.10
38	665	1.65	37	615	1.15	39	620	1.20
41	700	2.00	38	630	1.30	40	630	1.30
43	725	2.25	39	640	1.40	41	645	1.45
45	750	2.50	40	655	1.55	42	655	1.55
47	775	2.75	41	665	1.65	44	680	1.80
			43	690	1.90	45	690	1.90

APPENDIX M (cont.)

STEP Achievement Tests

Science Pre Test			Science Mid Test			Science Post Test		
Raw	T+	Z	Raw	T+	Z	Raw	T+	Z
13	310	-1.90	7	255	-2.45	17	295	-2.05
14	320	-1.80	9	275	-2.25	19	315	-1.85
16	340	-1.60	15	330	-1.70	20	325	-1.75
17	350	-1.50	16	340	-1.60	21	335	-1.65
19	370	-1.30	17	345	-1.55	22	345	-1.55
20	380	-1.20	19	365	-1.35	24	370	-1.30
21	390	-1.10	20	375	-1.25	25	380	-1.20
22	400	-1.00	21	385	-1.15	26	390	-1.10
23	415	- .85	22	395	-1.05	27	400	-1.00
24	425	- .75	23	400	-1.00	28	410	- .90
25	435	- .65	24	410	- .90	29	420	- .80
26	445	- .55	25	420	- .80	31	440	- .50
27	455	- .45	26	430	- .70	32	450	- .50
28	465	- .35	27	440	- .60	34	470	- .30
29	475	- .25	28	445	- .55	35	480	- .20
30	485	- .15	29	455	- .45	36	490	- .10
31	495	- .05	30	465	- .35	37	500	.00
32	505	.05	31	475	- .25	38	510	.10
33	515	.15	32	485	- .15	39	525	.25
34	525	.25	34	500	0.00	40	535	.35
35	535	.35	35	510	.10	41	545	.45
36	545	.45	36	520	.20	42	555	.55
37	555	.55	37	530	.30	43	565	.65
38	565	.65	38	540	.40	45	585	.85
39	575	.75	39	545	.45	47	605	1.05
40	585	.85	40	555	.55	48	615	1.15
41	595	.95	41	565	.65	50	635	1.35
42	605	1.05	42	575	.75	51	645	1.45
43	615	1.15	43	585	.85	52	655	1.55
44	625	1.25	44	595	.95	54	680	1.80
45	635	1.35	45	600	1.00	55	690	1.90
46	645	1.45	46	610	1.10	56	700	2.00
48	665	1.65	47	620	1.20			
49	675	1.75	48	630	1.30			
50	685	1.85	49	640	1.40			
53	715	2.15	51	655	1.55			
			52	665	1.65			
			53	675	1.75			
			55	695	1.95			

APPENDIX M (cont.)

STEP Achievement Tests

Soc. St. Pre Test			Soc. St. Mid Test			Soc. St. Post Test		
Raw	T+	Z	Raw	T+	Z	Raw	T+	Z
21	245	-2.55	19	180	-3.20	21	145	-3.55
23	265	-2.35	26	250	-2.50	25	190	-3.10
24	275	-2.25	27	260	-2.40	26	200	-3.00
25	280	-2.20	29	280	-2.20	34	290	-2.10
26	290	-2.10	30	290	-2.10	35	300	-2.00
28	310	-1.90	32	310	-1.90	36	310	-1.90
30	330	-1.70	34	330	-1.70	37	320	-1.80
31	340	-1.60	35	340	-1.60	38	330	-1.70
32	350	-1.50	38	370	-1.30	42	375	-1.25
33	360	-1.40	39	380	-1.20	43	385	-1.15
34	370	-1.30	42	410	- .90	45	405	- .95
35	380	-1.20	43	415	- .85	46	420	- .80
36	390	-1.10	44	425	- .75	47	430	- .70
37	400	-1.00	45	435	- .65	48	440	- .60
39	420	- .80	46	445	- .55	49	450	- .50
41	440	- .60	47	455	- .45	50	460	- .40
42	450	- .50	48	465	- .35	51	470	- .30
43	460	- .40	49	475	- .25	52	485	- .15
44	470	- .30	50	484	- .15	53	495	- .05
45	480	- .20	51	495	- .05	54	505	.05
46	485	- .15	53	515	.15	55	515	.15
47	495	- .05	54	525	.25	56	525	.25
48	505	.05	55	535	.35	57	535	.35
49	515	.15	56	545	.45	58	550	.50
50	525	.25	57	555	.55	59	560	.60
51	535	.35	58	565	.65	60	570	.70
52	545	.45	59	575	.75	61	580	.80
53	555	.55	60	585	.85	62	590	.90
54	565	.65	61	595	.95	63	600	1.00
55	575	.75	62	605	1.05	64	615	1.15
56	585	.85	63	615	1.15	66	635	1.35
57	595	.95	64	625	1.25	68	655	1.55
58	605	1.05	65	635	1.35			
59	615	1.15	68	665	1.65			
60	625	1.25						
61	635	1.35						
62	645	1.45						
63	655	1.55						
65	675	1.75						

APPENDIX M (cont.)

STEP Achievement Tests

Read. Pre Test			Read. Mid Test			Read. Post Test		
Raw	T	Z	Raw	T	Z	Raw	T	Z
12	240	-2.60	22	220	-2.80	20	190	-3.10
13	250	-2.50	23	230	-2.70	22	215	-2.85
15	270	-2.30	27	280	-2.20	24	240	-2.60
17	290	-2.10	28	295	-2.05	28	285	-2.15
19	310	-1.90	30	320	-1.80	31	320	-1.80
22	340	-1.60	31	330	-1.70	32	330	-1.70
23	350	-1.50	32	340	-1.60	33	345	-1.55
25	370	-1.30	33	355	-1.45	34	355	-1.45
26	380	-1.20	34	365	-1.35	35	365	-1.35
27	390	-1.10	35	380	-1.20	36	380	-1.20
28	400	-1.00	36	390	-1.10	37	390	-1.10
29	410	- .90	37	405	- .95	38	400	-1.00
30	420	- .80	38	415	- .85	39	415	- .85
31	430	- .70	39	425	- .75	40	425	- .75
32	440	- .60	40	440	- .60	41	435	- .65
33	450	- .50	41	450	- .50	42	450	- .50
34	460	- .40	42	465	- .35	43	460	- .40
35	470	- .30	43	475	- .25	44	470	- .30
36	480	- .20	44	490	- .10	45	485	- .15
37	490	- .10	45	500	.00	46	495	- .05
38	500	.00	46	510	.10	47	505	.05
39	510	.10	47	525	.25	48	515	.15
40	520	.20	48	535	.35	49	530	.30
41	530	.30	49	550	.50	50	540	.40
42	530	.40	50	560	.60	51	550	.50
43	550	.50	51	575	.75	52	565	.65
44	560	.60	52	585	.85	53	575	.75
45	570	.70	53	595	.95	54	585	.85
46	580	.80	54	610	1.10	55	600	1.00
47	590	.90	55	620	1.20	56	610	1.10
48	600	1.00	56	635	1.35	57	620	1.20
49	610	1.10	57	645	1.45	58	635	1.35
50	620	1.20	58	660	1.60	59	645	1.45
51	630	1.30	59	670	1.70	60	655	1.55
52	640	1.40	62	705	2.05	61	680	1.80
53	650	1.50						
55	670	1.70						
56	680	1.80						
58	700	2.00						
60	720	2.20						