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THE EFFECT OF PROGRAMMED INSTRUCTION ON THE SELF-ACCEPTANCE OF HIGH SCHOOL STUDENTS.

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AN INVESTIGATION OF PROGRAMED INSTRUCTION MATERIALS FOR HIGH SCHOOL STUDENTS WAS UNDERTAKEN TO PROVIDE INFORMATION ON POSSIBLE CHANGES IN SELF-ACCEPTANCE ATTITUDES. THE SAMPLE INCLUDED 80 STUDENTS, RANDOMLY DIVIDED INTO FIVE GROUPS, FROM THE LINCOLN COUNTY HIGH SCHOOL, PANACA, NEVADA. TRADITIONAL ENGLISH INSTRUCTION USING CONVENTIONAL TEXTBOOKS WAS COMPARED TO PROGRAMED INSTRUCTION USING ENGLISH 2600 AND/OR EDL WORD CLUES. THE INDEX OF ADJUSTMENT AND VALUES (BILLS, JANCE, AND MCLEAN, 1951) MEASURED STUDENTS' ACCEPTANCE BEFORE AND AFTER EACH EXPERIMENTAL TREATMENT. THE MEAN DIFFERENCE OF THE MAJOR VARIABLES OF IQ AND ACADEMIC ACCEPTANCE SCORES BETWEEN EACH GROUP OF SUBJECTS WAS TABULATED AND COMPARED. IT WAS CONCLUDED THAT PROGRAMED INSTRUCTION MAY ENHANCE SELF-ACCEPTANCE. FURTHER ENGLISH 2600 MAY HELP TO PROMOTE A MORE POSITIVE ACCEPTANCE OF SELF WITH "EDL WORD CLUES" EXERTING A LESSER INFLUENCE. RECOMMENDATIONS FOR FURTHER STUDY ARE INCLUDED. (JM)

WESTERN STATES SMALL SCHOOLS PROJECT

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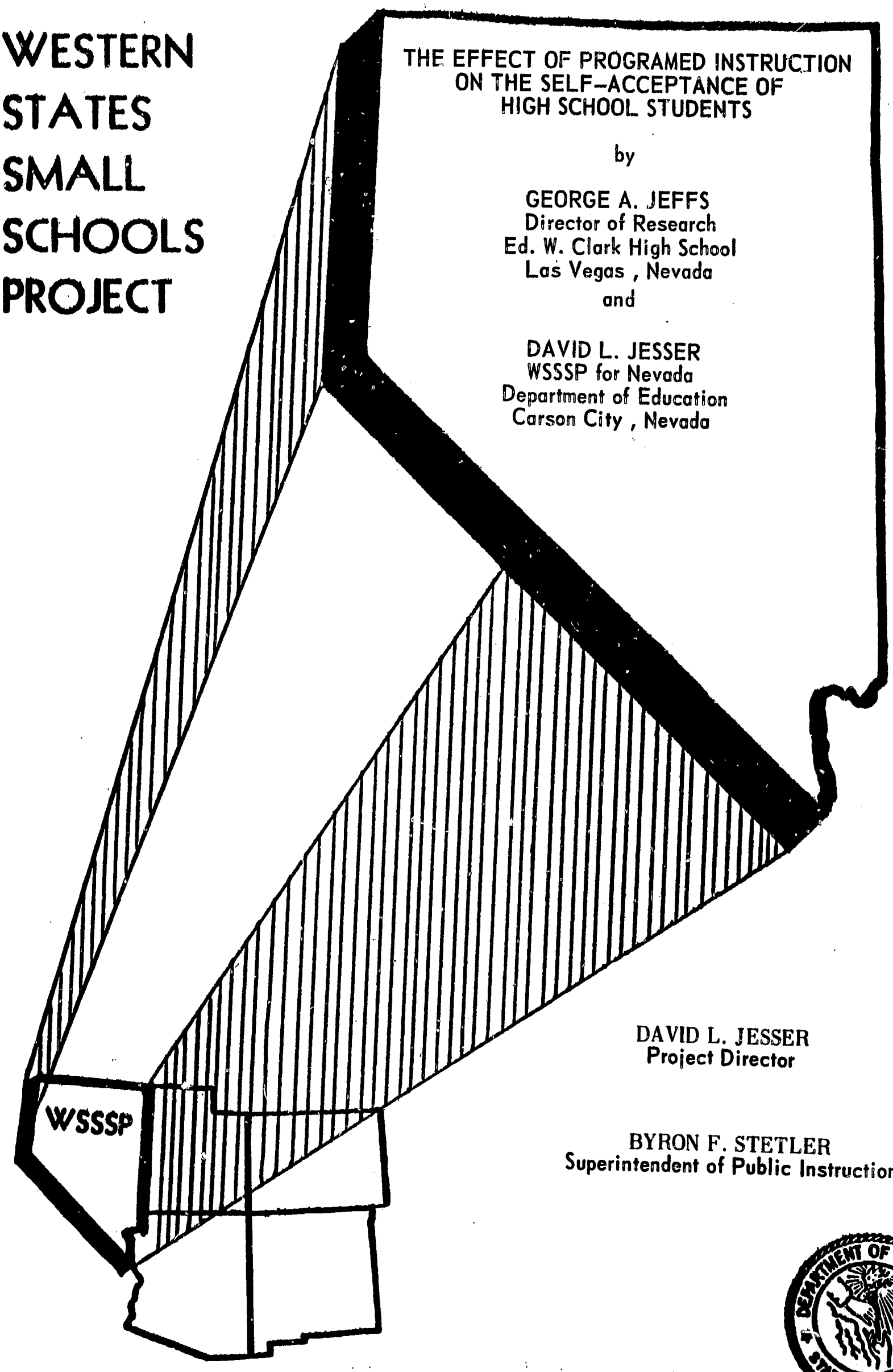

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CHAPTER I

INTRODUCTION

Programed instruction, either by means of text or machine, is no longer a novelty in the field of education. Although its effectiveness is still questioned by some researchers, and its acceptance refused by many classroom teachers, its growth, on the contrary, has not been hindered. In fact, the growth has been tremendously fast. As pointed out by Mills:

> An indication of the growth of the programed instruction field can be seen in the fact that reports of experiments with machines and programming numbered less than ten a year from 1948 to 1957, but in 1958 there were nearly forty studies and in 1959 there were over fifty (Mills, 1962, p.5).

This indication is further reinforced by Dr. Wilbur Schramm's statement made at the Albuquerque conference of 1962 on Programed Learning:

> ....there isn't any educational innovation that has ever come in with so much research built around its first year (Probst, 1962, p.4).

Although at present programed learnings are limited to courses such as mathematics, science, languages, logic, and psychology (Leese, 1962), as well as music, statistics, and shorthand, new areas have been proposed. Among others are programs for military training in armed forces, apprenticeship training in industry, retraining adults who are displaced by the advance of automation, educating teachers, and providing education in the newly developing countries (Probst, 1962).

The growing popularity and the increasing expansion of programed instruction, especially in "school situation" (Filep, 1963), are due to its various validated advantages over traditional teaching, such as immediate reinforcement (Mills, 1962; Skinner, 1961; Fry, 1964; Klaus, 1964), precise indication of the location and character of the mistakes (Mills, 1962; Skinner, 1961; Fry, 1964; Finn, 1964;

Klaus, 1964; Filep, 1963), active student participation (Mills, 1962; Skinner, 1961; Klaus, 1964), gradual progress at individual pace (Mills, 1962; Skinner, 1961; Fry, 1964; Finn, 1964), opportunity for individual instruction (Mills, 1962; Skinner, 1961; Fry, 1963; Finn, 1964; DeCecco, 1964), self-instruction (Mills, 1962; Calvin, 1960), better use of students' as well as teachers' time (Mills, 1962; Skinner, 1961; Fry, 1964; Blyth, 1960; DeCecco, 1964; Calvin, 1960), greater attention and motivation of the students (Mills, 1962; Skinner, 1961; Fry, 1964; Finn, 1964), greater retention of material (Mills, 1962; Skinner, 1961), and students of limited ability can have better achievement (DeCecco, 1964; Blyth, 1960; Leese, 1962). All in all, as Fischer summarizes:

> ...evidence is rapidly accumulating to show that when they (programed instruction) are wisely designed and employed, the devices can add to the effectiveness of teaching and learning. They can, to put it briefly, multiply the power of a good teacher and enable the student to use his own time and talent to better effect (Probst, 1962, p.2).

Since the above-mentioned advantages of programed instruction can contribute so much to the students' accomplishments at school, and academic achievements can shape to a great extent the self-concepts (Arnholter, 1956; Brislow, 1962; Roth, 1959; Bruck and Bodwin, 1962; Bruck, 1959; Conklin, 1940; Shaw, Edson and Bell, 1960; Payne and Farquhar, 1962; Hoyt, 1954), it seems logical to follow with the inference that self-concepts of those students receiving programed instruction will be more favorable than that of those receiving traditional instruction. Borg has pointed out:

> Part of the picture that makes up the pupil's self-concept is concerned with the school. This picture, of course, is highly complex and involves such matters as the individual's estimate of his achievement, his perception of his status relative to other pupils in the class, his satisfaction with his school role, and his attitudes about study (Borg, 1964, p. 233).

PROBLEM

A review of recent literature disclosed to the present writers that no research has been undertaken concerning a student's self-concept and/or self-acceptance and programed learning It is, therefore, the attempt of this study to explore the aforesaid variables.

The problem is to investigate whether there will be any significant difference concerning self-acceptance, a segment of self-concept, of high school students before and after programed learning.

IMPORTANCE

Programed study is still in its early stages of development (Probst, 1962; Filep, 1963). Hence, much experimentation and more research are needed in order to assure its effective function and improvement. Probst has already pointed out:

> Programed instruction has developed from research, and it also suggests much useful education research..... We need to know much more about the relation of motivation and success.... (Probst, 1962, pp. 22-24).

We need (of even greater significance) to know about the effect of programed learning on the self-concepts and/or self-acceptance of our students. Some contemporary personality theorists emphasize the self-concept as the basic determiner of an individual's behavior (Rogers, 1951; Combs and Snygg, 1959; Lecky, 1945). In general, these theorists consider that the necessity to preserve and enhance the self-concept is a basic human motivation. In order to protect his self-concept, the individual tends to learn and to do only what he perceives himself as valuing and capable of doing, whereas those things he sees as inconsistent with his self-concept, he pushes away (Leese, 1962; Landsman, 1962; Gore, 1960; Roth, 1959; Jersild, 1952; Bills, Vance and McLean, 1951;

Lecky, 1945). Cornebise has well demonstrated this point as he says:

> ...a teacher needs be concerned about the self-concepts of her pupils involving the nature of learning. Many psychologists concur that the individual has one primary interest throughout life - - - that of self-enhancement....if the learning situation is judged by the learner to be detrimental to his self-concept, he will erect certain defense mechanisms which might consist of rebellion or attempts to escape the harmful situation....Learning becomes effective, then, only when related to the self (Cornebise, 1963, p. 190).

It is hoped that the results of this research may serve to help assess the impact of programed instruction in our classroom learning; that, too, its findings may suggest means for better use of such technological method in our classroom teaching.

HYPOTHESIS

The current study is designed to test the following basic hypothesis, stated in null form.

It is assumed that there will be no significant difference in self-acceptance of high school students after receiving programed instruction.

TERMINOLOGY

Due to the various approaches of programed instruction in existence, and the wide interpretation of self-concept by different authors, it will be desirable to define those key terms employed in this study under separate sections.

Programed Learning

The materials of programed learning were presented via programed textbooks in the following manner: after reading some information, the student was asked to respond to a question based on that information by marking one of the multiple-choice answers or by writing his answer in a blank space provided; the correct answer was then revealed. He then moved to the next bit of information, on which he must again immediately answer a question, and so on. Each small step follows from and builds on the preceding step.

This breakdown of material into small sequential steps is based on experimentally validated principles of successful learning to insure clear understanding and high motivation, great interest and active participation on the part of the learner (Probst, 1962).

Self-Concept - Self Acceptance

The term, self-concept, has a wide range of interpretations. It has been defined as the individual's unique central inner force by Horney (Moustakas, 1956), a central psychological reality by Murphy (1961), an operating process by Gordon (1956) and Field (1963), an organized perceptual object resulting from past experiences by Raimy (Combs and Snygg, 1959), and the individual's feelings, attitudes, ideas, and values by Borg (1964), Landsman (1962), Washburn (1961), and Gore (1960).

Self-concept has also been treated as two selves - - - true and idealized self - - - by several writers (Moustakas, 1956; Hopkins, 1954; Brownfain, 1952; Brislow, 1962; Bills, Vance, and McLean, 1951).

For the purpose of this study, self-concept refers to the meaning by Bills. It is regarded as "the traits and values which the individual has accepted" (Bills, 1951, p. 257) as a description of himself.

Self-acceptance might be thought of as being one facet of self-concept. In describing the three (including self-acceptance) scores derived from Bills' Instrument, Borg (Borg, 1964, p. 255) states, "In any event, however, the reader is safe in assuming that the three scores measure closely related aspects of the individual's total self-concept."

While the concept-of-self denotes the way he sees himself as he is, the ideal-concept-of-self reflects the way he would like to be. A positive self-concept, hence, is defined as a small discrepancy between self-concept and ideal-self-concept, whereas a large discrepancy indicates a negative self-concept. It is generally agreed that, both in self-concept theory and in experimental evidence, a negative self-concept designates stress and tension within the individual, and a positive self-concept reflects a well-adjusted, self-integrated person (Jervis, 1959).

CHAPTER II

REVIEW OF LITERATURE

Introduction

Programed instruction and self-concept have been familiar subjects in the domains of education and psychology during the past decade. Landsman has already pointed out:

> In recent years, the search amongst behavioral scientists for an understanding of learning has seemingly led into two quite opposite directions. The first, now pursued by all alert, up-to-date school boards, is the atomistic direction represented by the teaching machine.....A second direction searches for the answers to learning problems in the learner himself - - - in his self-concept, his image of himself (Landsman, 1962, p. 289).

Volumes of books have been devoted to interactions of programed instruction and self-concept with various aspects of the individual, such as personality, intelligence, academic achievement, performance, motivation, age, sex, and other variables. However, no study has been undertaken concerning the relationship between programed instruction and the learner's self-concept and/or self-acceptance.

This chapter will, therefore, treat the two topics individually. The first part reviews recent research on programed instruction versus traditional instruction. The relationships between programed instruction and variables such as intelligence, academic achievement, age and sex of the learner will be examined. Students' as well as teachers' reactions toward programed learning will be discussed. A variety of related studies will be selected and treated separately to gain a better insight into the operation of programed instruction. The same treatment will be employed for the latter part, concerning self-concept and its relationships with the individual's intelligence, achievement, age and sex.

Programed Learning Versus Traditional Learning

One of the first systematic studies comparing programed and traditional instruction was performed by Pressey and his students (Little, 1934). This study compared the effectiveness of the multiple-choice device (punchboard), the automatic test-scoring device, and the conventional classroom teaching. The subjects of the study were college students in an educational psychology class. Two experimental groups, one using the multiple-choice device and one using the automatic test-scoring device, were matched with the control group for intelligence and prior knowledge of subject matter. The findings indicated that both experimental groups achieved higher scores on a multiple-choice final examination than did the control group.

Hough (1962), to investigate the comparative effectiveness and efficiency of teaching machine instruction and the conventional lecture-discussion method of instruction, employed as subjects forty-one college juniors and seniors enrolled in the course, "The Contemporary Secondary Education". Teaching machine instruction was found to be equally effective as the lecture-discussion technique. Without the opportunity for out-of-class study of lecture notes, teaching machine method appeared to be more effective. Moreover, less time was needed to cover the equal amount of material by the machine technique. Similar findings were obtained by Ferester and Sapon (1959) with a group of college students studying German; by McNamara and Hughes (1961) with a class of IBM custom engineers in a training course; and by Porter (1959) with groups of sixth-grade students learning spelling.

Calvin (1960), in a study with a group of eighth-grade pupils, found that the students were able, without teacher, textbooks, or homework, to cover an entire year of ninth-grade algebra by means of teaching-machines in one semester.

At the Albuquerque conference on programed learning in 1962, three experiments were reported on the experience of programed instruction in the schools on Duval County, Florida (Probst, 1962). During the spring of 1961, programed instruction was offered to three experimental algebra groups, with a control group matched for comparison. The control students studied algebra in the conventional manner with a traditional textbook, whereas the experimental students used either programed textbooks or teaching machines. The three experimental groups were different in the amount and kind of teaching performed by the teacher. In the least favorable situation, the teacher, who was not a certified mathematics teacher, gave no help to students, but only supervised. In the next situation, the teacher responded to students' questions arising from their work. In the most favorable situation, the teacher actively participated in teaching by giving supplementary material. The results were inconclusive. Nonetheless, opinions were offered indicating that the students' as well as the teachers' time in the experimental groups was more efficiently used. During the summer session of 1961, another experiment on algebra was conducted. Fifty-four students worked with teaching machines five hours a day for sixty days. The class was larger than average to see whether a teacher could manage with reasonable success if programed instruction was employed. It was found that, although there was a tremendous burden on the teacher, it was possible, but not desirable for one teacher to handle a larger than average class with the aid of the teaching machines. In the following fall, control and experimental groups in thirteen classes totaling 440 students in seven schools were again organized in algebra. There was also one class in plane geometry and another in English which used programed instruction. Findings are still being analyzed at the present time, but the reactions of students, their

parents, and the teachers were reported to be favorable. Students were attentive, and the material seemed to be better retained than in the conventional instruction. The teachers found they had to know the material better than before, and they had to know the students better.

Two crucial conclusions were suggested by the Duval County experiments. First, programed technique calls for a better trained teacher than does the traditional method. This point has been consistently stressed by several researchers (Filep, 1963; Finn, 1964; DeCecco, 1964; Barous, Hayman, and Johnson, 1964). Second, programed textbooks were found to be more flexible than machines. Stolurow (1962) has predicted that programed textbooks will eliminate the necessity for teaching machines in the future because of their economy and convenience.

At the Albuquerque conference, the experimentation of programed instruction in the Lakewood High School, Ohio, was also reported (Probst, 1962). The high school offered an algebra improvement course using a programed text during the summer of 1961. The class met two hours daily for six weeks, and students were permitted to spend more time on algebra at home whenever they wished. The programed-class students showed greater gains in their understanding of algebra than did another algebra improvement class in the same summer school using the regular teacher-textbook approach. With programed instruction, student motivation was high with each student accepting responsibility for his own progress. Disciplinary problems did not exist.

Moore and Smith (1961), with a class of twenty-eight sixth graders learning spelling, and Norman (1962), with 128 freshmen cadets at the United States Air Force Academy learning elementary statistics, found no conclusive results to determine which instructional technique, programed or traditional, can produce better learning. Nevertheless, it was concluded that, with

programed instructional devices, students learned at least equally well compared with other methods, and they often learned in less time. This conclusion is substantiated by the findings of Barcus, Hayman, and Johnson (1964), and Reed and Hayman (1962).

Relationships Between Programed Learning and Other Variables

Intelligence.

Eigen and Felhdusen (1964), to determine the interrelationships among learner variables - - - intelligence, achievement, reading, attitude, and transfer - - - in programed instruction, used a total of ninety-six ninth-, tenth-, and eleventh-grade students as subjects. They found that students' IQ scores, while initially correlated with learning, were not correlated with their acquisition resulting from programed instruction. The ability of the students to transfer what had been learned by means of a programed device was determined more by how much had been learned than by IQ per se. This may be due to the fact that much direct attention has been paid by program researchers to matters related to cueing, sequencing of frames and of hierarchy. Klaus (1964) also supports this theory.

In a study to examine whether there was a positive and significant relationship between performance on achievement tests following programed instruction and on problem solving tasks that required originality (originality was defined as the ability to make specific, but multiple, associations to a stimulus) for their solution, Stolurow (1964) selected a group of twenty gifted students (CA 13-15; IQ 112-157) from a problem solving institute as subjects. Their learning experience consisted of self-instructional programed materials in logic, mathematics and statistics over a six-week period. The students were given three Guilford type tests

(Consequences, Unusual Uses, and Plot Titles) and two TAT (Thematic Apperception Test) cards with the requirement that they make up stories about them which then were scored for originality. In addition, each subject's grade-point average was obtained. It was found that IQ and Mental Age did not correlate with any of the achievement scores based upon programed learning. Moreover, the correlations between IQ and originality, between Mental Age and originality were essentially zero. DeCecco (1964) has pointed out that thirty current research investigations on creativity show there are zero correlations between IQ and originality. The finding of Getzels and Jackson (1959), too, is congruent with this conclusion.

To investigate which is the best approach, automated or teacher-directed to teach elementary Spanish, and when is the best time to introduce it, Barcus, Hayman, and Johnson (1964) launched a study with a total sample of 6,000 sixth-graders. The pupils were randomly divided into two groups at the beginning of the year. Selections were by class instead of by individual pupil, that is, half of the classes were placed into one group and the other half in the other. Each group consisted of approximately ninety classes. One group started receiving programed learning at the beginning of the first semester, while the other did not start until the beginning of the second semester. Each of the major groups was in turn randomly subdivided into two equal parts, with one subgroup under traditional method and the other under teaching-machine device. In all analyses, IQ, grade-point average, and listening comprehension pretests were used as control variables, on which groups were equated. Among other findings, the influence of IQ was found to have no overall effect except

that higher IQ pupils generally did better with any form of instruction than lower IQ pupils.

Shay (1961) examined the relationship between intelligence and size of item step (step size referred to the difficulty of giving the correct answer) on a teaching machine program under the criterion conditions of total learning, learning involving rote materials including understanding, error, and time to complete the program. Three programed teaching sequences of 103, 150, and 199 items were developed covering fourth-grade Roman numerals. Each was written for a level of ability, and step size adjusted to meet stated criteria. Ninety fourth-graders in four Los Angeles elementary schools were selected on the basis of pretest and intelligence test scores. From each of the three ability levels (above average, IQ >110; average, IQ 93-109; below average, IQ<92) three groups of ten subjects were randomly selected and each group assigned to one of the programs, making nine experimental groups. The subjects completed 50 items a day on successive days until program completion, which was immediately followed by the post-test. The results indicated no relationship between intelligence and step size on a teaching machine program for the stated criteria. Shay suggests that among the reasons for not finding a relationship between intelligence and step size, may be that group intelligence tests are less effective predictors of learning ability where programed teaching sequences are involved than is the case in the ordinary classroom, where the variables such as step size, reading level, sequencing are not controlled. This suggestion seems to have significant implication to the finding of Eigen and Feldhusen (1964), Stolurow (1964), and Barcus, Hayman, and Johnson (1964), that learners' IQ has no overall effect on their acquisition of programed learning.

The insignificance of IQ in a programed-learning situation, however, is questioned by the results of Reed and Hayman's study (1962) involving use of programed text English 2600. They investigated the following problems: Does English 2600 work equally well with pupils of high academic achievement, pupils of average achievement, and pupils of low achievement? Do pupils of varying abilities require different lengths of time to work through English 2600? Five high schools participated in the study. In each school, two tenth-grade English classes were chosen as experimental groups using the textbook English 2600. With each of these experimental groups a control group in the same school was matched, following the traditional instruction. The ten experimental classes and the ten control classes included groups in English of high, average, and low ability. Approximately 250 pupils were involved in the experimental groups. Two pre-tests and two post-tests were administered to all twenty classes. One of the two tests was the language Section of the California Battery, and the other was the final test of English 2600. In addition, each subject's IQ score, English grade-point average for Grade 9, the grade-point average of other subjects, and test score from the section of Correctness in Writing of the Iowa Tests of Educational Development (measurement of achievement in English grammar) were obtained. The study covered a period of three months. The results indicated that English 2600 was more effective with high achieving students than it was with low achievers. No significant difference was found between average achieving students of the experimental and control groups. Furthermore, more able students worked through the programed text faster than did average ability pupils, who in turn, worked faster than did low achievers. Finally, high achievers thought each unit was

easier than did the other students, and made fewer errors, while average achievers were second in each case. Reed and Hayman commented that the findings of substantial differences among high, average, and low achieving students on difficulty rating, error rate, and time rate raised "serious questions as to use of the automated instructional materials with pupils of widely differing academic abilities." This is in contrast to Shay's finding as well as Skinner's position that, "It is not necessary to provide more than one program on the basis of different initial ability." (Shay, 1961, p. 103).

Academic Achievement

Stolurow (1964), in his study of the relationship between originality and achievement with a group of twenty gifted children, found that the Guilford and TAT originality scores of his subjects correlated significantly with their achievement scores of logic, mathematics and statistics based upon programed learning.

Barcus, Hayman, and Johnson (1964), with a sample of 6,000 sixth-graders learning elementary Spanish, found that timing was an important factor in determining the effectiveness of automated instruction. Automated instruction was ineffective the first semester, but was as effective as traditional instruction in the second semester. The authors indicated that the program used in their study presumed a certain prior knowledge of Spanish at the audio-lingual level, and probably most of the subjects did not possess the knowledge at the beginning of the first semester sixth-grade. It seems then that a person's prior knowledge of the related program rather than timing is more important in determining the effectiveness of programed instruction. This position is substantiated with the finding of Eigen and Feldhusen (1964) that students' reading ability, study method, attitudes

toward the program as well as school were not generally correlated with their success in learning or transferring from the program. Rather, the students' general achievement level when they undertook programed instruction seemed to be the major variable related to their success in learning. Barcus, Hayman, and Johnson also found that classroom teachers had a crucial effect on the students' achievement on programed learning. Since in the situation of programed learning, as the authors pointed out, the students progress at their own rates, they are almost on their own, and motivation to learn is of great importance. The classroom teacher is considered as contributing the major portion to the students' motivation. This indication is substantiated by their finding that those pupils with the best qualified teachers learned more than did those with poorly qualified teachers. The significance of teachers' motivational spirit as related to students' achievement in programed learning has also been stressed by Marmor (1963) and Marriman (1963).

That programed learning helped students of low academic ability and slow learners achieve to a level they had never attained before was reported by Marmor (1963) and by Curry (1963) who used programed-text English 2600 as the tool.

The questions of intelligence and achievement in programed learning has been distinctively pointed out by Stolurow as he proposes:

> Two important trends to be verified and developed..... The first is that aptitude differences tend to lose their predictive value when more efficient methods of teaching are employed. Consistent with this finding is the observation from a variety of sources that individual differences tend to be reduced with teaching machines. The tendency is for the lower-ability individuals to achieve more, and thereby to become more like the higher-ability group in their performance on the programmed learning course (Leese, 1962, p. 316).

Age

Eigen and Feldhusen (1964), who examined the interrelationships among learner variables in programed instruction with a group of ninety-six ninth-, tenth-, and eleventh-grade students, found that students' attitudes toward the program became increasingly correlated, from ninth- to eleventh-grades, with their success in learning.

Sex

Evans, Glaser, and Homme (1962) examined the possible relevance of the sex variable in programed learning in symbolic logic. Each subject's (27 male and 33 female college students) total error scores were taken as the overall index of text performance. No significant difference in error scores was found.

Students' and Teachers' Reactions to Programed Learning

In the research of Marriman (1963), Reed and Hayman (1962), and Norman (1962), opinions of the participating students and teachers in programed learning were obtained. By and large, the students did respond favorably to the method of instruction, did consider it more efficient, and did feel that they could progress at their own rate and had more opportunity to receive individual assistance from the teacher than under traditional method. On the negative side, programed learning received criticism such as boring, monotonous, busy-work, repetitious, and confusing. Marriman suggested that most of the students' negative opinions could be offset to a certain extent by greater motivation on the part of the students, and much of this responsibility rested with the classroom teachers. This point has been discussed earlier under the section of programed instruction and academic achievement.

From the teachers' standpoint, some felt that programed instruction should be used only with small classes in order that the teacher have time to provide individual help to students as they progressed through the work. Others felt that only the better students should be given programed instruction as it was too difficult for many to hold their attention to the program at hand. Among the advantages of the method listed by teachers were immediate reinforcement, meeting of individual needs, progress at individual speeds, increased teacher time available for individual problems, and novelty of the device. Among the disadvantages they cited were cheating, lack of motivation and desire of the students to make full use of the materials, and boredom. The teachers also suggested that programs differing in approach and difficulty be available for below-average students.

Marriman (1963, p. 331) emphasized that we should not regard programed instruction as a "strictly self-taught" device with no effort on the part of the learner or that of the instructor. Moreover, we must recognize programed instruction not as a panacea, "...but for what it is, a very important aid to learning."

Summary

The following paragraphs by Stolurow can well serve the purpose of summarizing the findings of current research on programed-instructional technique:

> Much of the initial research was conducted to show that these methods and materials modified student behavior in desired ways.....The results are clear that a student's knowledge can be increased in this way. Furthermore, they show that increased knowledge can be produced in a variety of different students, with a variety of different materials and with a variety of different procedures - - - program and machine as the sole source of information; programmed

> materials used as a supplement to a regular course of instruction. The variety of students who show these changes is broad and include the mentally retarded, normal and gifted children, the deaf, college undergraduates and graduate students, and adults working on job training situations. The most consistent finding is that students learn at least equally well compared with other methods of instruction. Furthermore, they often learn in less time by means of auto-instructional methods (Stolurow, 1962, p. 520).

Self-Concept

The importance of an individual's self-concept involved in a learning situation has been stressed by most contemporary personality theorists and substantiated by many recent research findings as has been discussed in Chapter I under the section of significance. It is also commonly believed that each individual is in continuous search of self (Jersild, 1952; Cornebise, 1963; Moustakas, 1956; Rogers, 1951; and Hilgard, 1949). There seems to be a constant search to answer such questions as: Who and what is he? How can he get in contact with his real self? When an individual accepts himself, he will continue to mature and develop, or else much of his energies will be utilized in defensive behaviors (Cornebise, 1963; Brownfain, 1952).

Than an individual's changing, developing complex of self-concepts are easily influenced by his situation and learning experiences have been indicated by Tyler (1959; 1961), Landsman (1962), and Combs and Snygg (1959); and that such concepts affect aspiration or choice has been suggested by Herriott (1963).

Bruck and Bodwin (1962) defined a normal self-concept as consisting of such elements as: (a) self-confidence; (b) freedom to express appropriate feelings; (c) liking for one's self; (d) satisfactions with one's attainment;

and (e) feeling of personal appreciation by others.

According to Gore (1960), an individual's evolving self-concept can be appraised in three facets, namely: his feelings, his peer relationships, and his achievements. These indications seem to have broad implication to the present study, as it is an attempt to investigate a person's self-concept.

In an investigation of the stability of the self-concept as a dimension of personality, Brownfain (1952) distributed several series of self-ratings on personality to sixty-two members of two men's cooperative houses at the University of Michigan. Each subject rated himself four successive times in four different frames of judgment, each one designed to yield a different type of self-concept as follows: (a) the "private self", what he believed he really was; (b) the "positive self", what he really hoped he would be; (c) the "negative self", what he feared he really was; and (d) the "social self", how he believed his peers saw him. All findings supported the theoretical prediction that subjects with stable self-concepts were better adjusted than those with unstable self-concepts. They had a higher level of self-esteem, and were more free of inferiority feelings and nervousness; they were better liked and considered more popular by their peers; they saw themselves more as they believed other people saw them; and they showed less evidence of compensatory behavior of a defensive kind.

It is commonly held that a positive self-concept is indicated by a low discrepancy score (D-Score) between one's self and ideal-self ratings. Jervis (1959), however, questioned its validity. He constructed a self-concept measuring instrument, the Self Description Inventory, and administered to a sample 850 college students. His findings showed that a low D-Score

does not always indicate a positive self-concept, as a low D-Score may also be characterized by a low-self score and low ideal-self score.

That it is unreliable to predict a person's adequate adjustment by means of his low D-Score was also revealed in Chodorkoff's study (1954) which involved thirty male undergraduates. He concluded that although the most adequately adjusted subjects showed the highest correspondence between perceived and ideal-self, the least adequately adjusted subjects did not necessarily show the least correspondence.

In an investigation of the relationship between expressed feelings of adequacy and the correspondence between the perceived and ideal-self of thirty hospitalized veterans (20-40 years of age), Lepine and Chodorkoff, (1955) found that the more an individual tended to express feelings of adequacy, the greater was the correspondence between his perceived and ideal-self.

Acceptance of Self and Acceptance of Others

Kipnis (1961), to examine the effects of interpersonal perception on self-evaluations, employed eighty-seven male students living together in a university dormitory as subjects. Self-evaluations of their own personality traits were examined in relation to their perception of their best friends. Kipnis concluded that self-evaluations were formulated through comparison between the self and others, and individuals tended to perceive smaller differences between themselves and their best friends than between themselves and a least liked roommate.

Using data based on ten randomly selected cases by the Counseling Center at the University of Chicago, Stock (1949) launched an investigation

into the interrelations between the self-concept and feelings toward other persons and groups. The total results of her study showed a definite relationship between the way an individual felt about himself and the way he felt about other persons. In general, an individual having negative feelings toward himself tended to have negative feelings toward others. As his feelings about himself changed to positive, feelings about others changed in a similar direction.

Scheerer (1959), by employing the same technique, also found a definite correlation between acceptance of and respect for self and acceptance of and respect for other people. A similar finding was revealed by Phillips (1951).

To examine whether or not the positive relationship between acceptance of self and acceptance of others would exist to the same extent with larger groups and more varied samples than had previously been studied, Berger (1952) included 315 college day-session students, college evening-session students, prisoners, stutterers, YMCA adult students, speech problem individuals, and counselees. A special scale was constructed to measure expressed acceptance of self and expressed acceptance of others. The positive correlation between self-acceptance and others-acceptance was definitely supported by the findings.

The substantial relationship between acceptance of self and acceptance of others has also been demonstrated by the theoretical concepts of Adler (1921) who contended that "a tendency to disparage" arose out of inferiority feelings as a compensation; of Fromm (1939; 1947) who emphasized that self-love and love of others should go hand in hand; of Horney (1937; 1939) who stated that the person who did not believe himself lovable is unable to love

others; and Rogers (1951) who proposed that a person's understanding and acceptance of himself would lead to greater understanding and more acceptance of others as separate individuals.

Relationships Between Self-Concept and Other Variables

On the basis of data from many sources, Loevinger proposes, as summarized by Anastasi, that

> Ability to form a self concept increases with age, intelligence, education, and socio-economic level. At the lowest point, illustrated by the infant, the individual is incapable of self conceptualization. As the ability develops, he gradually forms a stereotyped, conventional, and socially acceptable concept of himself. This state (is considered) to be typical of adolescence. With increasing maturity, the individual progresses beyond such a stereotyped concept to a differentiated and realistic self concept. At this point, he is fully aware of his idiosyncracies and accepts himself for what he is.....the level of self conceptualization attained by the individual is a basic determiner of his impulse control, social attitudes, and other important aspects of personality (Anastasi, 1963, p. 625).

The studies reviewed through the rest of this chapter will further confirm the position held by Loevinger.

Intelligence

In Gorlow's study (1963), a number of hypotheses relating self-concepts of institutionalized retardates to their achievement (intellectual level school achievements, success in occupational training, success on parole), to facets of their experience (time of separation from the parental home, length of institutionalization), and to certain other dimensions of their personality (social values, modes of expression of hostility) were examined. A sample of 164 was drawn from a population of

institutionalized retarded women between the ages of 16 and 22. IQ's ranged from 50 to 80, with achievement levels from the first through the seventh-grade. Length of institutionalization at the time of original testing ranged from four months to eight years. The Laurelton Self Attitudes Scale was administered to each subject in individual sessions. Scores on subjects of this scale were related to a wide range of measures in the areas of achievement, early experience, and personality. Findings disclosed small but significant positive relationships between self-acceptance and measures of intelligence. Moreover, those who were separated from their parents at an early age expressed more negative self-attitudes than others. This finding is congruent, as Gorlow indicated, with the expectation that self-attitudes are formulated at an early age and are influenced by family stability. Self-acceptance, too, was found to be associated with certain dimensions of social needs and certain modes of response to hostility. There was a tendency for those expressing a high degree of self-acceptance to express less need for the support of others and to accept their own hostility. The last finding (that a major concern of the individual is the enhancement and defense of the self) is in accord with the view of Rogers (1951) and Cornebise (1963).

In an investigation of the effect of intelligence on relationships between anxiety and attitudes toward self and others, Phillips, Hindeman, and Jennings (1960) predicted the relationships between anxiety and dissatisfaction with self and others to be higher for mentally dull subjects than for subjects with high intelligence, under the assumption that when a person was unable to make responses which led to success, frustration was produced and anxiety was aroused. This study involved 709 seventh-graders.

It was found that anxious subjects expressed more self- and other-dissatisfaction than less anxious subjects. This result substantiates the generally accepted hypothesis that anxiety produces dissatisfaction with self and others. These relationships, nevertheless, were modified to some extent when intelligence of the subjects was considered. Relationships were found to be significantly higher for subjects with high intelligence. The authors presumed that this meant that bright subjects became more ego-involved in school activities, developed higher expectations and goals, and consequently suffered more frustration and anxiety in school situations than subjects with low intelligence.

Academic Achievement

In their study to investigate the self-concept of underachievers as compared with that of the achievers, Shaw, Edson, and Bell (1960) chose a sample of high school juniors and seniors with IQ scores of 113 or above as measured by the Primary Mental Abilities Test. A student was classified as an achiever if his cumulative grade point average since entering high school was 2.00 or above; an underachiever, 1.75 or below. The subjects were categorized into four groups: male achievers (N = 20), male under-achievers (N = 19), female achievers (N - 21), and female underachievers (N - 27). The Sarbin Adjective Checklist was employed to measure the students' self-concepts. Major findings may be concluded as follows: (a) differences in self-concept did exist between achievers and underachievers; (b) male underachievers had more negative feelings about themselves than did male achievers; (c) female underachievers tended to be ambivalent with regard to their feelings toward themselves; and (d) no cause and effect relationships were indicated by the obtained data. These findings are

supported, at least in part, by that of Barret (1957) who reported that underachievers tended to lack a "feeling of worth as an individual".

In Bruck's experiment (1946), the relationship between self-concept and achievement of 300 third-, sixth-, and eleventh-grade pupils was examined. The self-concept was measured by the Draw-A-Person Test, and achievement was determined by grade-point average. It was found that self-concept and grade-point average were significantly correlated at all three grade levels.

The substantial relationship between self-concept and academic achievement was also found by Gorlow (1963) with a sample of 164 institutionalized retarded women.

Conklin (1940), in a case study aimed at discovering differences between academically successful and academically unsuccessful gifted children, found that unsuccessful children had low self-concepts.

In a study by Bruck and Bodwin (1962), the relationship between self-concept and the presence or absence of underachievement in students with normal or higher intelligence was examined. Underachievement was defined as being one year or more retarded in grade levels on achievement test scores in one or more subject areas. The subjects consisted of sixty children, referred to a Child Guidance Clinic in Michigan, with an average IQ score of 90 - 110 on the California Mental Maturity Test. The group was equally divided into three subgroups of third-, sixth-, and eleventh-grades. In turn, each group was evenly divided between ten boys and ten girls. Five of ten pupils in each group of these sub-groups were academic under-achievers as defined above. Hence, half of the total group represented thirty pupils with no learning difficulties, while the other half

represented thirty underachievers. The Self-Concept Scale of the Machover Draw-A-Person Test (SCS-DAP), a projective technique, was administered to these subjects. The findings showed a positive relationship between educational disability and immature self-concept as measured by the SCS-DAP, although no cause and effect relationship was claimed.

Roth (1959), to explore the relationships between self-concept and achievement, drew his subjects from three reading improvement classes at the University of Texas. A sample of fifty-four freshmen was used, consisting of nine females and forty-five males. The data revealed significant differences in the self-perceptions of those who improved, did not improve, and dropped out of the reading improvement program. The improvers had the smallest discrepancies between the Self and Ideal-Self ratings, while the dropouts had the greatest. It was also found that changes in self-concept and grade-point average indicated those who achieved, as well as those who did not, did so as a result of the needs of their own self system.

In a study to determine the significance of self-evaluation as a non-intellectual factor in scholastic achievement, Brislow (1962) made a distinction between general self-evaluation and student self-evaluation. The former referred to the self-ideal-self discrepancy, whereas the latter referred to the student self-ideal-student discrepancy. A questionnaire - - - consisting of the student behavior description, four adjective scales (self, student-self, ideal, ideal-student), and a personal history page - - - designed to yield general and student self-evaluation was given to a representative sample of 197 college freshmen prior to and after their first semester. Four experimental groups, which did not differ in terms of scholastic aptitude, certain demographic factors, and educational-vocational plans, were

extracted as follows: achievers (n = 84) and underachievers (N = 21), both oriented toward academic attainment; and achievers (N = 55) and underachievers (N = 26), not so oriented. The following conclusions were made: First, students who underachieved scholastically could not be distinguished from those who achieved scholastically on the basis of general self-evaluation before and after their first semester in college, regardless of an intention to strive for scholastic achievement as a prime goal. Secondly, regardless of initial intention to strive for scholastic achievement as a goal, students who underachieved scholastically had a poorer conception of themselves as students than did achievers subsequent to their academic performance. Thirdly, where students exhibited an intention to strive for scholastic achievement as a prime-goal, underachievers had a more pessimistic conception of themselves as students than did achievers before their actual scholastic performance. This, however, was not true where scholastic achievement was not a prime-goal. Lastly, where scholastic achievement was a prime-goal, where the student had a good conception of himself as a student, and where he did achieve scholastically, his general self-evaluation became more favorable from pre- to post-semester assessment. This too, however, was not true where scholastic achievement was not a prime-goal.

According to Borg's summary of Checkering's study (Borg, 1964), the self-concept of 109 ninth-graders was measured, and the self-ideal-self discrepancy scores were compared with achievement. A significant negative relationship was obtained between achievement and the discrepancy score, indicating that higher achieving students had smaller discrepancies between self and ideal-self thus implying better adjustment.

Martire (1956), in his investigation concerning the relationships between self-concept and differences in the strength of achievement motivation

with a group of fifty-three male college students, found that subjects who had high n Achievement (need for achievement) scores under both "Neutral" and "Achievement-Motivating" conditions had a significantly greater discrepancy between their self and ideal-self sortings on the five achievement related traits combined (intelligence, initiative, Creativeness, Motivation, General Success) than other subjects.

In the development of an objective instrument to measure the academic self-concepts of high and low motivated students, Payne and Farquhar (1962) attested that a student's self-concept was a major determinant of his success in an academic performance that interacted with motivation; and the student learned what he perceived he was able to. Moreover, others such as teachers and close friends had crucial influences in the conceptualization of a student's self-concept. The last indication is congruent with the experimental findings of Kipnis (1961).

The positive correlation of self-concept and achievement, however, is shadowed by the finding of Jervis (1959), who related the self-concept ratings of 850 college students to their predictions of academic achievement, and actual academic performance. No significant relationship was found between self-concept and prediction of grades. Results only suggested a tendency toward overestimation of academic achievement by positive self-concept individuals. Furthermore, there were no significant relationships between self-concept scores and grades of actual academic achievement.

Age

To identify the various patterns of self-concept and their stages of maturity in high school and college students, Washburn (1961) administered a self-constructed instrument to a sample of high school and college students of both sexes. It was found that college students tended to score higher

than high school students on the mature self-levels.

That the maturity of self-concept increases with age was also revealed in Bruck's experiment (1946) between pupils at the third- and eleventh-grade levels.

Perkins (1958), in his research regarding factors influencing change in children's self-concepts, used a Q-sort instrument for measuring his subject's self-concept. Pupils completed two sorts: one for self-concept, and one for ideal-self concept. Self-ideal-self congruency was determined by correlating the two Q-sorts. The subjects consisted of 251 fourth- and sixth-graders. It was found that the correlation between self and ideal-self increased between fourth- and sixth-grade.

Sex

The existence of sex difference in self-concept was revealed at all academic levels. At the levels of elementary (Perkins, 1958; Bruck, 1946), and secondary (Shaw, Edson and Bell, 1960; Bruck, 1946; Washburn, 1961) females were found to have a more mature and better adjusted self-concept than their male counterparts, whereas at the college level (Washburn, 1961) the trend was reversed.

Other Pertinent Research

In Benjamins' experiment (1950) on the relationship between changes in the pupil's self-concept concerning his intellectual level and changes in his performance on a group intelligence test, forty-eight subjects from two high school classroom groups were studied. Results showed that changes in the individual's self-concept as induced by the false reports of his first test results led to similar changes in his performance on a later test, thus reflecting the individual's effort to achieve a balance between his performance

and his self-concept. That a person's self-concept can lead to changes in his behavior in order to protect his self-concept has been the position held by some theorists in this field (Raimy, 1948; Lecky, 1945; Jersild, 1952; and Rogers, 1951).

To investigate the relationship between authoritarianism, intelligence, ambiguity tolerance, and adequacy of personal adjustment, Davids (1955) examined twenty male undergraduate subjects. It was found that authoritarianism, correlated positively with manifest anxiety and negatively with intelligence. No significant relationship was found between authoritarianism and tolerance of ambiguous visual or auditory stimuli.

In studying two commonly neglected dimensions of self-perceptsion - - - uncertainty and pessimism - - - Steiner (1957) gave a five-page questionnaire to each of his subjects which included forty-four members of an undergraduate class in psychology. The following findings were obtained. First, persons with uncertain self-perceptions inclined: (a) to set goals which were high relative to their past performance; (b) to expect their performance scores to vary considerably over time; (c) to be more likely than others to overestimate their future performance; and (d) to be less certain than other persons that their announced goals were realistic. Second, persons with pessimistic self-perceptions were likely: (a) to make low and pessimistic estimates of their future performance; and (b) to be intropunitive in their explanations of their performance.

Summary

From the studies reviewed in the latter section of this chapter, several significant aspects of self-concept have emerged. First, self-concept is a major determinant of one's behavior, and a person attempts to maintain its

and his self-concept. That a person's self-concept can lead to changes in his behavior in order to protect his self-concept has been the position held by some theorists in this field (Raimy, 1948; Lecky, 1945; Jersild, 1952; and Rogers, 1951).

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Summary

From the studies reviewed in the latter section of this chapter, several significant aspects of self-concept have emerged. First, self-concept is a major determinant of one's behavior, and a person attempts to maintain its

balance with his performance at all times. Secondly, although the early self-concept is stabilized in the pre-school years, crucial changes are likely all through life due to the influences of one's environment, experiences, learning and other variables. Thirdly, a significant and substantial relationship exists between one's concept toward self and one's concept toward others, whether positive or negative. Fourthly, evolvement of the self-concept increases with intelligence, education, and age of an individual. Finally, females, in general, have a more favorable self-concept as opposed to males.

CHAPTER III

METHODS AND PROCEDURE

Sample Selection

Population

The high school - Lincoln County High School, Panaca, Nevada - involved ... in the present investigation showed an enrollment of about 175 students during the 1963- 1964 academic year. The school population consists of students of Panaca as well as those from Pioche and Caliente, adjacent cities. Panaca is mainly a farming community, whereas Pioche and Caliente are predominantly mining and ranching respectively. These cities are of lower-middle socio-economic conditions, and have approximately 2,100 inhabitants in total. Lincoln County High School is the only high school serving these three cities, and no college or university exists in the county.

Lincoln County High School was chosen for the research undertaken in view of the following circumstances: (1) this school offered programed instruction in English; (2) the competence and experience of the English instructor was adequate; and (3) the cooperation and enthusiasm exhibited by the superintendent, principal and faculty was positive.

Sample

The subjects participating in the research included one freshman group of thirty-six students and one junior group of fifty-two students. However, due to the absence and departure of some of the students, the final sample was reduced to a total of eighty, thirty-two freshmen and forty-eight juniors of both sexes, thirty-six boys and forty-four girls. The sophomore class was not used because programed instruction was not offered this group. The seniors were eliminated because of the inappropriateness of the self-acceptance instrument.

At the beginning of the school year, the freshmen subjects were randomly divided into three groups (F-I, F-II, and F-III), and the juniors into two groups (J-IV and J-V). Information such as the mean IQ scores, overall grade-point average for both semesters (1963-1964), mean chronological age, and sex differences of each group was obtained from school records.

Group F-I (N=15, six boys and nine girls) had an IQ range of 81-125 with a mean of 104.92; a grade-point average of 2.79; and a mean chronological age of fourteen years and eleven months. Group F-III (N=9, two boys and seven girls) had an IQ range of 81-115 with a mean of 94.25; a grade-point average of 1.76; and a mean chronological age of fifteen years and four months. Group J-IV (N=22, ten boys and twelve girls) had an IQ range of 80-127 with a mean of 103.10; a grade-point average of 2.26; and a mean chronological age of sixteen years and six months. Group J-V (N=26, eleven boys and fifteen girls) had an IQ range of 86-118 with a mean of 103.58; a grade-point average of 2.32; and a mean chronological age of sixteen years and eight months. The Henmon-Nelson intelligence test was used to determine IQ for the freshmen, and the Kuhlman-Anderson intelligence test was used to determine IQ for the juniors. The mean age of each group was established from the focal date of January 1, 1964.

Experimental Treatment

The difference in treatment of the various groups involved the time offered and texts from which students received programed instruction. In essence, two instructional approaches, programed and traditional, were provided. In the traditional method, the students, using conventional English textbooks, followed English instruction as the teacher ordinarily planned. Under the programed approach to instruction, however, the conventional texts were replaced by programed textbooks English 2600 and/or edl word clues (Book G).

The F-I students received programed instruction during the first semester, using two programed texts, and traditional instruction the second semester. The F-II subjects received programed instruction during the first semester, using two programed texts, and traditional instruction the second semester. The F-II subjects received traditional instruction during the first semester and programed instruction the second semester using only English 2600. The F-III group received instruction in a traditional manner throughout the entire academic year, with no programed instruction being involved. At the eleventh grade level, the J-IV subjects received programed instruction both semesters using edl word clues only, while J-V students received traditional instruction during both semesters. The design is shown in Table I. Such an arrangement provides both experimental and control groups. One group may act as an experimental group during one semester and as a control group the next semester. Such an arrangement, further, permits within-group comparisons.

Another major variable should be indicated at this point - the teacher. Previous research has shown that the instructor's competence as well as his motivational spirit plays an important role in the success of programed instruction (Barcus, Hayman, and Johnson, 1964; Marmor, 1963, Marriman, 1963). Subjects in both the programed and traditional groups studied under the same instructor. This instructor was thoroughly familiar with programed instruction.

TABLE I: EXPERIMENTAL TREATMENT FOR EACH GROUP

Group	First Semester	Second Semester
F-I	Programed Instruction (English 2600 and edl word clues)	Traditional Instruction (conventional textbooks)
F-II	Traditional Instruction (conventional textbooks)	Programed Instruction (English 2600)
F-III	Traditional Instruction (conventional English textbooks)	
J-IV	Programed Instruction (edl word clues)	
J-V	Traditional Instruction (conventional English textbooks)	

The students' acceptance of self was measured three times by means of The Index of Adjustment and Values. The first administration was in September, 1963, at the beginning of the academic year. The second administration was in January, 1964, at the end of the first semester. The last administration was in May, 1964, at the termination of the academic year. The first administration served as the pre-test for the first and second semester. The second administration served as the post-test for the first semester and at the same time as the pre-test for the second semester. The last administration served as the post-test for the second and both semesters.

Instruments

For the purpose of the present research, programed instruction was presented to the students by means of two programed textbooks, English 2600 and edl word clues. Either one or both programs served as the experimental variables for the programed groups during treatments. The Index of Adjustment and Values was a measure of students' acceptance of self before and after each experimental treatment. A general description of each of the instruments may provide the reader with a better understanding of this study.

English 2600 (Revised Edition)

English 2600 (Blumenthal, 1962) was one of the first programed textbooks published for school use. The original copy was published in 1960. It is a blend of text and workbook which presents fundamentals of English grammar and usage through 2632 brief exercises or frames. English 2600, in 11 units of 69 lessons, covers basic facets of sentences, modifiers, verbs, pronouns, capitalization, and punctuation. In each lesson, the explanation, examples, and exercises of certain principles are blended into thirty or forty small steps or sequences that require "reasoned-thought" written responses from the learner. A booklet of unit-tests is provided with each text for measurement of student comprehension. The entire book can be completed in one semester, and any student who has reading ability of about the 9th grade level can complete the text.

The effectiveness and unique features of English 2600 have been reported by classroom teachers (Marmor, 1963, Curry, 1963) as well as by researchers Reed and Hayman (1962) and Griffin and Knudson (1962) who commented on it as a means to make English grammar an interesting subject and a text appropriate for high school students at all abilities and learning levels.

edl word clues (Book G)

The program edl word clues (Taylor, 1962) is basically a vocabulary exercise book at the high school level written by Stanford Taylor, Helen Frackenpohl, Arthur McDonald, and Nancy Joline, and published by Educational Development Laboratories. The goal as well as the uniqueness of this program lies in the approach to help students master their vocabularies by using the context or the words around the unfamiliar word to "unlock" its meaning. There are thirty lessons consisting of 300 frames. The vocabularies are exposed to the student in a story-manner to arouse and maintain his interest as well as to

help acquaint him with the words from different angles. A final exercise in word meanings is included at the end of the text to help evaluate the student's word mastery.

The Index of Adjustment and Values (High School Form)

The measure of self-acceptance used in the current study was the Index of Adjustment and Values (IAV), authored by Robert E. Bills (Bills, Vance, and McLean, 1951). The initial form, the Adult Index, was published in 1951 and since that time a considerable amount of research has been undertaken on it and subsequent forms (Borg, 1964).

The Adult Index of IAV consists of forty-nine adjectives which were selected from Allport and Odbert's list of 17,953 trait words. As the manual attests, the Adult Index has been validated as a reliable and useful measure of an individual's self-acceptance, beliefs about other people's acceptance of themselves, and discrepancies between self and ideal-self-concepts. Below the 12th grade, however, the Adult Index was found to be inappropriate due to the essential differences in the abstract conceptual ability of 11th and 12th grade individuals. Hence, other forms of the Index were developed in 1957 for use at lower academic levels: the Elementary School Form for grades 3, 4, and 5; the Junior High School Form for grades 6, 7, and 8; and the High School Form for grades 9, 10, and 11.

The present investigation employed only the High School Form of the IAV (HIAV). Reliability coefficients reported by Bills are relatively high. Bills reported corrected split-half reliabilities of the "Self" form of the High School Index of Adjustment and Values ranging from .76 to .94. Bills also reported the mean self-acceptance score to be 142.74, while the standard deviation for self-acceptance was 21.40 (Bills Manual, Index of Adjustment and Values).

The HIAV contains thirty-seven trait words. For each of the trait words the subject is asked to respond to three questions about himself: (1) how he is in regard to the trait word (self-concept); (2) how he feels about being such a person (self-acceptance); and (3) how he would like to be in respect to the trait (ideal-self-concept). Each of the ratings is made on a five point scale, from the least to the most liked. A copy of the HIAV may be found in Appendix A.

A student is asked to finish all the three ratings for each word before going on to the next. There is no time limit for the test. In general, it takes about fifteen minutes for each subject to complete the form, excluding instruction time. In addition to the "Self" form, the HIAV also requires the subject to give similar responses to "Others," in which he is asked to fill in the information as he thinks the average individual in his group would do for himself. The "Others" form of the HIAV has not been used in this study. The omission of the "Others" form is based on the following rationale. The sole function of the "Others" form lies in its other-acceptance score (the student's belief of other peoples' acceptance of themselves), which is related to the subject's self-acceptance score to yield a categorical score.

Scoring of the "Self" form of the HIAV is concentrated on the self-acceptance scores. The method for scoring is to add up all thirty-seven ratings on this column. The total score should have a minimum of thirty-seven (if all the trait words were given a rating of one) and a maximum of 185 (if all the trait words were given a rating of five).

Statistical Analysis

Analysis of the data was completed by employing covariance analysis and the t-test. Covariance analysis permits adjustments in terminal scores by taking into account differences in initial variables.

Since each group of subjects was tested three times under different conditions, the t-test for correlated observations (Edwards, 1959) was employed to analyze the obtained difference between the two means is reported according to the two-tailed test. The t-test for independent observations (Edwards, 1959) was also used to examine the mean difference of the major variables of I.Q., academic acceptance scores between each group of subjects. Sex distribution was analyzed by means of a percentage difference (Edwards, 1959).

CHAPTER IV

FINDINGS AND DISCUSSION

The basic hypothesis of the present study is that there will be no significant difference in self-acceptance of high school students after receiving programed instruction. The results are reported and discussed on the basis of each group followed by inter-group discussions concerning the variables IQ, academic achievement, age, sex, and initial mean self-acceptance scores. The two tailed test of significance appears appropriate. The results may be found in Table II. All the self-acceptance scores, standard deviations, t-ratios, and significance levels are included in Tables III and IV. Tables V and VI offer the reader a summary of self-acceptance scores, intelligence test scores, grade point averages, chronological ages, and sex distribution for each group. Table VII affords the reader a review of the results obtained when the data were treated with covariance analysis

Findings

Single-group analysis, findings

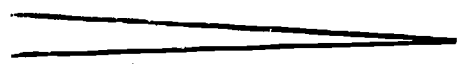
Group F-1. The F-1 Group received programed instruction (English 2600 and edl word clues) during the first semester and traditional instruction during the second semester of the current study. The mean self-acceptance score for this group in September, 1963, was 124.40. In January 1964, after having received programed instruction for one semester, the mean self-acceptance score increased to 141.00. An analysis by the t-test method indicated that the increment was significant at the .02 level. In May, 1964, after receiving no programed instruction during the second semester, the mean self acceptance score for Group F-1 was reduced to 129.60,

TABLE II: MEAN SELF-ACCEPTANCE SCORES AND THE LEVEL OF SIGNIFICANCE OF EACH GROUP

Group	Mean Self-Acceptance Scores		
	$\bar{X}_1$ (Sept. '63)	$\bar{X}_2$ (Jan. '64)	$\bar{X}_3$ (May '64)
F-I	124.40 — 2% → 141.00 — 1% → 129.60		
	$\bar{X}_1$ — no significant difference — $\bar{X}_3$		
F-II	126.50 — No ↔ 131.87 — app. 5% → 146.50		
	$\bar{X}_1$ — 1% → $\bar{X}_3$		
F-III	141.77 — No ↔ 141.66 — No ↔ 141.77		
	$\bar{X}_1$ — no significant difference — $\bar{X}_3$		
J-IV	137.45 — No ↔ 140.18 — No ↔ 143.72		
	$\bar{X}_1$ — Approaching 5% → $\bar{X}_3$		
	145.30 — No ↔ 147.69 — No ↔ 145.19		
	$\bar{X}_1$ — no significant difference — $\bar{X}_3$		

Key:


= significant increment


= significant decrement

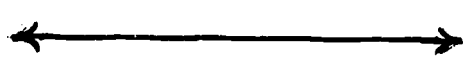

= no significant difference

TABLE III: MEAN SELF-ACCEPTANCE SCORES AND STANDARD DEVIATIONS FOR EACH GROUP

Group	N	Time of Testing	$\bar{X}$ S-A Scores	SD
F-I	15	Sept. '63 ($\bar{X}_1$)	124.40	9.38
		Jan. '64 ($\bar{X}_2$)	141.00	15.21
		May '64 ($\bar{X}_3$)	129.60	12.57
F-II	8	Sept. '63 ($\bar{X}_1$)	126.50	13.03
		Jan. '64 ($\bar{X}_2$)	131.87	22.25
		May '64 ($\bar{X}_3$)	146.50	19.70
F-III	9	Sept. '63 ($\bar{X}_1$)	141.77	17.30
		Jan. '64 ($\bar{X}_2$)	141.66	16.70
		May ($\bar{X}_3$)	141.77	13.20
J-IV	22	Sept. '63 ($\bar{X}_1$)	137.45	17.15
		Jan. '64 ($\bar{X}_2$)	140.18	16.56
		May '64 ($\bar{X}_3$)	143.72	14.83
J-V	26	Sept. '63 ($\bar{X}_1$)	145.30	15.62
		Jan. '64 ($\bar{X}_2$)	147.69	13.95
		May '64 ($\bar{X}_3$)	145.19	20.44

TABLE IV: MEAN DIFFERENCES IN SELF-ACCEPTANCE SCORES, t-RATIOS, AND SIGNIFICANCE LEVELS OF GROUPS

Group	$\bar{X}$	$\bar{X}$-Dif.	t	α
F-I	$\bar{X}_1 - \bar{X}_2$	-16.60	2.79(14df)	2%
	$\bar{X}_2 - \bar{X}_3$	11.40	3.05(14df)	1%
	$\bar{X}_1 - \bar{X}_3$	- 5.20	1.42(14df)	No
F-II	$\bar{X}_1 - \bar{X}_2$	- 5.37	1.05(7df)	No
	$\bar{X}_2 - \bar{X}_3$	-14.63	2.28(7df)	6%
	$\bar{X}_1 - \bar{X}_3$	-20.00	3.52(7df)	1%
F-III	$\bar{X}_1 - \bar{X}_2$	0.11	0.02(8df)	No
	$\bar{X}_2 - \bar{X}_3$	- 0.11	0.04(8df)	No
	$\bar{X}_1 - \bar{X}_3$	0.00	0.00(8df)	No
J-IV	$\bar{X}_1 - \bar{X}_2$	- 2.75	0.92(21df)	No
	$\bar{X}_2 - \bar{X}_3$	- 3.54	1.29(21df)	No
	$\bar{X}_1 - \bar{X}_3$	- 6.27	2.04(21df)	6%
J-V	$\bar{X}_1 - \bar{X}_2$	- 2.39	0.91(25df)	No
	$\bar{X}_2 - \bar{X}_3$	2.50	0.52(25df)	No
	$\bar{X}_1 - \bar{X}_3$	0.11	0.03(25df)	No

significant at the .01 level. A comparison of the first and third mean self-acceptance scores showed no significant difference. The hypothesis must be rejected.

Group F-II. Group F-II received traditional instruction during the first semester and programed instruction (English 2600) the second semester of the present investigation. The mean self-acceptance score for this group was 126.50 in September, 1963. At the termination of the first semester, Group F-II showed a mean self-acceptance score of 131.87. No significant difference was found between the two means. A mean self-acceptance score of 146.50 for this same group after receiving programed instruction during the second semester, however, was found to be nearly significantly above the January mean. This increment approached the .05 level. A comparison was also made between the first (126.50) and third (146.50) mean and the result revealed an increment significant at the .01 level. The hypothesis must be rejected.

Group F-III. The F-III group was treated by traditional instruction during both semesters Table III disclosed that the mean self-acceptance score for this group in September, 1963, was 141.77, while the mean self-acceptance scores for January and May of 1964 were 141.66 and 141.77 respectively. No significant difference between any pairs of means was found. In fact, the first self-acceptance mean score obtained at the beginning of the academic year and the third self-acceptance mean score obtained at the termination of the academic year were identical. The hypothesis must be accepted.

Group J-IV. Group J-IV received programed instruction (edl word clues) during the first as well as the second semester of this study. This group

posted a mean self-acceptance score before programed instruction of 137.45. After one semester of programed instruction their mean self-acceptance score advanced to 140.18, while at the termination of the academic year it was 143.72. No significant increment was discovered between the first and second and second and third means. However, an increment was found, approaching the .05 level, between the first and third mean self-acceptance scores. The hypothesis must be accepted.

Group J-V. Group J-V received no programed instruction but followed traditional instruction throughout the academic year of this study. The treatment was similar to that of Group F-III, and similar results were disclosed. The first mean self-acceptance score was 145.30; the second, 147.69; and the third, 145.19. No significant differences were found between any two mean self-acceptance comparisons. The hypothesis must be accepted.

Comparison of groups.

The reader should refer to Tables V and VI as relates to the following discussion.

Groups F-I and F-II. As revealed by a t-test analysis of the differences between two means, the F-I and F-II subjects were found to be similar in their initial mean self-acceptance scores, mean intellectual level, and mean chronological age (Table VI). An analysis of academic achievement as established by grade-point average, however, showed that Group F-I possessed a significantly (.05 level) higher academic attainment level than Group F-II. Group F-II was also found to have a significantly greater percentage of boys than Group F-I.

Groups F-II and F-III. The F-II and F-III students had most of the characteristics in common. No significant differences were found between these two groups in initial mean self-acceptance, intellectual level academic achievement, or chronological age.

TABLE V: MEAN SELF-ACCEPTANCE SCORES, I.Q., GRADE-POINT AVERAGE, CHRONOLOGICAL AGE, SEX DISTRIBUTION AND STANDARD DEVIATIONS FOR EACH GROUP

Group	N	Variable	X-Score or B/G	SD or B/G %
F-I	15	Initial S-A	124.40	9.38
		IQ	104.92	12.20
		Gr. Pt. Ave.	2.79	0.93
		Age Yr. - No.	14-9	5.23
		Sex B/G	6/9	40% / 60%
F-II	8	Initial S-A	126.50	13.03
		IQ	101.42	11.97
		Gr. Pt. Ave.	2.00	0.67
		Age Yr. - No.	14-11	9.77
		Sex B/G	7/1	87% / 13%
F-III	9	Initial S-A	141.77	17.03
		IQ	94.25	11.57
		Gr. Pt. Ave.	1.76	0.61
		Age Yr. - No.	15-4	7.04
		Sex B/G	2/7	22% / 78%
J-IV	22	Initial S-A	137.45	17.15
		IQ	94.25	11.57
		Gr. Pt. Ave.	2.26	0.71
		Age Yr. - Mo.	16-6	5.96
		Sex B/G	10/12	45% / 55%
J-V	26	Initial S-A	145.30	15.62
		IQ	103.58	6.30
		Gr. Pt. Ave.	2.32	0.83
		Age Yr. - Mo.	16-8	6.60
		Sex B/G	11/15	42% / 58%

TABLE VI: MEAN DIFFERENCE IN SELF-ACCEPTANCE SCORES, t-RATIOS, AND SIGNIFICANCE LEVELS FOR VARIABLES BETWEEN GROUPS

Group	Variable	$\bar{X}$-Dif.	t or z	∝
F-I - F-II	Initial S-A	-2.10	0.46 (21df)	No
	IQ	3.50	0.63 (19df)	No
	Gr. Pt. Ave.	0.79	2.19 (21df)	5%
	Age (Mo.)	-2	0.58 (21df)	No
	Sex (B)	-47%	z 3.35	1%
F-II - F-III	Initial S-A	-15.27	2.08 (15df)	No
	IQ	7.17	1.19 (13df)	No
	Gr. Pt. Ave.	0.24	0.80 (15df)	No
	Age (Mo.)	-5	1.42 (14df)	No
	Sex (B)	65%	z 3.82	1%
F-I - F-III	Initial S-A	-17.37	3.31 (22df)	1%
	IQ	10.67	2.05 (20df)	6%
	Gr. Pt. Ave.	1.03	3.02 (22df)	1%
	Age (Mo.)	-7	3.11 (21df)	1%
	Sex (B)	18%	z 1.05	No
J-IV - J-V	Initial S-A	-7.85	1.81 (46df)	No
	IQ	-0.48	0.20 (42df)	No
	Gr. Pt. Ave	-0.06	0.30 (44df)	No
	Age (Mo.)	-2	0.13 (44df)	No
	Sex (B)		z 0.21	No

However, a difference significant at the .01 level was obtained between Groups F-II and F-III in percentage of sex distribution.

Groups F-I and F-III. In contrast to the preceding two groups, the F-I and F-III groups showed few similarities of variables. Group F-I was found to be substantially higher than Group F-III in intelligence (approaching the .05 level) and academic achievement (.01 level). However, Group F-I was found to be significantly lower than Group F-III in initial self-acceptance and mean chronological age, both at the .01 level of confidence. As concerns distribution of sex, no significant difference was obtained between Groups F-I andF-III.

Groups J-IV and J-V. No significant differences were found when comparing the variables initial self-acceptance, intelligence, academic achievement, chronological age, or sex distribution between the two groups of juniors.

Covariance analysis, findings

The reader is referred to Table VII for an overview of the results obtained by covariance analysis. Covariance analysis permits compensation for initial differences in groups. The present study was designed to compensate for initial group differences in self-acceptance, intelligence, grade point average (achievement), and chronological age.

Groups F-I and F-II. Group F-I received programed instruction (English 2600 and edl word clues) during the first semester and traditional instruction during the second semester Group F-II received traditional instruction the first semester and programed instruction (English 2600) the second semester. A comparison of these groups during the first semester showed no significant difference in self-acceptance; however, a comparison of these groups during the second semester revealed a significant (.01 level) difference in self-acceptance. This finding is important to the hypothesis of this study because such hypothesis stated that this difference would not occur. The hypothesis, therefore, must be rejected.

Groups F-I and F-III. Group F-I received programed instruction (English 2600 and edl word clues) during the first semester while Group F-III received traditional instruction. A significant (.01 level) difference in self-acceptance between these two groups was discovered. The hypothesis must again be rejected. Both groups received traditional instruction during the second semester of the current study. A significant (.05 level) difference in self-acceptance between these two groups during the second semester was disclosed.

TABLE VII: A COMPARISON (F) OF FINAL MEAN SELF-ACCEPTANCE SCORES OF THE VARIOUS GROUPS AND COMBINATIONS OF GROUPS+

Groups	First Semester	Second Semester	Total Year
F-I vs. F-II	2.961 p-t	10.870* t-p	
F-I vs. F-III	4.535* p-t	4.920** t-t	
F-II vs. F-III	.098 t-t	9.552** p-t	
J-IV vs. J-V	.935 p-t	.329 p-t	.312 p-t
F-I vs. F-II - F-III	5.509** p-t		
F-II vs. F-I - F-III		12.142* p-t	
F-I boys vs. F-II - F-III boys	.052 p-t		
F-I girls vs F-II - F-III girls	.768 p-t		
F-II boys vs. F-I - F-III boys		10.708* p-t	
J-IV boys vs. J-V boys	.821 p-t	.948 p-t	1.821 p-t
J-IV girls vs. J-V girls	.819 p-t	.919 p-t	1.110 p-t
F-I vs. J-IV	.151 p-p	.450 t-p	
F-I vs. J-V	5.941** p-t	3.006 t-t	
F-II vs. J-IV	.521 t-p	4.256 p-p	
F-II vs. J-V	.530 t-t	8.431* p-t	
F-III vs. J-IV	1.722 t-p	1.791 t-p	1.818 t-p
F-III vs. J-V	1.695 t-t	.063 t-t	.176 t-t
F-I, F-III vs. J-IV		.440 t-p	
F-I - F-III vs. J-V		.039 t-t	
F-II - F-III vs. J-IV	.329 t-p		
F-II - F-III vs. J-V	.560 t-t		
F-I - J-IV vs. F-II - F-III - J-V	1.337 p-t		
F-II - J-IV vs. F-I - F-III - J-V		3.930 p-t	

\+ = analysis of covariance
* = 1 per cent level of confidence
** = 5 per cent of confidence

p-t = first group programed, second traditional
t-p = first group traditional, second programed
t-t = both groups traditional instruction
p-p - both groups programed instruction

Groups F-II and F-III. Group F-II received traditional instruction during the first semester and programed instruction (English 2600) during the second semester. Group F-III received no programed instruction. A significant (.05 level) difference in self-acceptance between these two groups was disclosed at the close of the second semester. The hypothesis must once again be rejected.

Groups J-IV and J-V. Group J-IV received programed instruction (edl word clues) both semesters of the academic year during which the current study was undertaken. Group J-V received traditional instruction during both of these semesters. No significant difference in self-acceptance between these two groups was discovered. The hypothesis must be accepted.

Groups F-I and F-II - F-III. Group F-I received programed instruction (English 2600) during the second semester of this study. Group F-I - Group F-III received traditional instruction during the same period of time. A significant (.01 level) difference in self-acceptance was detected between these two groups. The hypothesis then, must be rejected.

Groups F-II and F-I - F-III. Group F-II received programed instruction (English 2600) during the second semester of this study. Group F-I - F-III received traditional instruction during the same period of time. A significant (.01 level) difference in self-acceptance was detected between these two groups. The hypothesis, then, must be rejected.

Groups F-I boys and F-II - F-III boys. The F-I boys received programed instruction (English 2600 and edl word clues) during the first semester while the F-II - F-III boys received traditional instruction. No significant difference in self-acceptance was noted. The hypothesis must be accepted.

Groups F-I girls and F-II - F-III girls. Group F-I girls received programed instruction (English 2600 and edl word clues) during the first semester of the current study. The group composed of F-II and F-III girls

received traditional instruction during this same period of time. No significant difference in self-acceptance was detected. The hypothesis must be accepted.

Groups F-II boys and F-I - F-III boys. The F-II boys received programed instruction (English 2600) during the second semester of the present investigation while the F-I - F-III boys received traditional instruction. A significant (.01 level) difference in self-acceptance was noted. The hypothesis, therefore, must be rejected. A comparison of these groups involving girls was not made because but one girl was found in the F-II group.

Groups J-IV boys and J-V boys. Group J-IV boys received programed instruction (edl word clues) throughout the entire academic year of this study while the J-V boys received traditional instruction during the same period of time. No significant self-acceptance difference was noted. The hypothesis must be accepted.

Groups J-IV girls and J-V girls. Group J-IV girls received programed instruction (edl word clues) during the entire course of this study. J-V girls received traditional instruction during the entire course of this study. No significant self-acceptance difference was identified. The hypothesis must be accepted.

Groups F-I and J-IV. Group F-I received programed instruction (English 2600 and edl word clues) during the fall semester of the present study and received traditional instruction during the spring semester of the study. The J-IV students received programed instruction (edl word clues) during both the fall and spring semesters. A comparison of these groups at the end

of the second semester revealed no significant difference in self-acceptance. The hypothesis must be accepted.

Groups F-I and J-V. The F-I group received programed instruction (English 2600 and edl word clues) during the first semester and traditional instruction during the second semester of this study. The J-V group received traditional instruction during both semesters. The first semester comparison, which compared Group F-I receiving programed instruction, with Group J-V receiving traditional instruction, divulged a significantly (.05 level) different report of self-acceptance. The hypothesis must be rejected.

Groups F-II and J-IV. Group F-II received traditional instruction during the first semester and programed instruction (English 2600) during the second semester. Group J-IV received programed instruction (edl word clues) throughout the entire course of this study. No significant difference in self-acceptance between these two groups was noted. The hypothesis must be accepted.

Groups F-II and J-V. Group F-II received traditional instruction during the fall semester of the current study. This same group received programed instruction (English 2600) during the spring semester of this study. Members of the J-V group received traditional instruction throughout the course of this study. During the time when these two groups received different types of instruction (second semester), a significant (.01 level) difference in self-acceptance was noted. The hypothesis must be rejected.

Groups F-III and J-IV. Group F-III members received traditional instruction during both semesters of the present study. The members of the J-IV group received programed instruction (edl word clues) during both

semesters of the present study. No significant difference in self-acceptance between the members of these two groups was noted. The hypothesis must be accepted.

Groups F-III and J-V. Neither of the compared groups received programed instruction. Significant differences in self-acceptance might not be expected, nor were such differences obtained.

Groups F-I - F-III, and J-IV. The first group (F-I - F-III) of this comparison received traditional instruction during the second semester while the second group (J-IV) of this comparison was receiving programed instruction (edl word clues). A significant difference in self-acceptance as reported by these groups was not indicated. The hypothesis must be accepted.

Groups F-I - F-III, and J-V. All groups involved in this comparison received traditional instruction during the second semester of the study. Self-acceptance as reported by the members of these groups at the termination of the study proved not to be significantly different.

Groups F-II - F-III, and J-IV. All groups involved in this comparison received traditional instruction during the second semester of the study. Self-acceptance as reported by the members of these groups at the termination of the study proved not to be significantly different.

Groups F-II - F-III and J-IV. Group F-II - F-III received traditional instruction during the first semester of this study. Group J-IV received programed instruction (edl word clues) during this same period of time. A comparison of self-acceptance reports at the conclusion of the first semester showed no significant difference between groups. The hypothesis must be accepted.

Groups F-II - F-III and J-V. All groups involved in this comparison received traditional instruction during the first semester of the present study. An analysis of the data revealed no significant difference in self-acceptance between the groups involved.

Groups F-I- J-IV and F-II - F-III - J-IV. Group F-I - J-IV received programed instruction (English 2600 and edl word clues) during the first semester of this study and Group F-II - F-III - J-V received traditional instruction during the same period of time. No significant difference in reported self-acceptance by the two groups was noted. The hypothesis must be accepted.

Groups F-II - J-IV and F-I - F-III - J-V. Group F-II - J-IV received programed instruction (English 2600 and edl word clues) during the second semester of the present study. Group F-I - F-III - J-V received traditional instruction during the second semester of the current study. A comparison of reported self-acceptance scores at the termination of the second semester disclosed a difference which did not reach but approached significance. The hypothesis must be accepted.

Discussion

Single-group analysis, discussion

Group F-I. The results obtained from the F-I group revealed that the self-acceptance of these students was enhanced significantly (.02 level) after one semester of programed instruction (English 2600 and edl word clues). However, after a semester of traditional instruction, acceptance-of-self by this group returned to approximately the same level it was prior to receiving programed instruction. The hypothesis, that there will be no significant enhancement of self-acceptance of high school students after receiving programed instruction, is therefore rejected.

One point of interest might be examined at this time. The F-I students' self-acceptance was enhanced significantly after first semester programed instruction, but reverted back to about the same level as the September self-acceptance after the second semester with no programed instruction as attested by the mean self-acceptance scores of 124.40, 141.00, and 129.60. The rationale behind this change in self-acceptance may not be difficult to perceive. First, the crystallization of a person's self-concept and/or self-acceptance is a complex, long-termed, and ever-going process. Such attitudes are influenced by amny personal factors (Gorlow, 1963; Phillips, Hindeman, and Jennings, 1960; Anastasi, 1963; Washburn, 1961; Bruck, 1946; Perkins, 1958; Shaw, Edson, and Bell, 1960), social factors (Klpnis, 1961; Stock, 1949; Scheerer, 1949; Phillips, 1951; Berger, 1952; Herriott, 1963), educational factors (Anastasi, 1963; Gorlow, 1963; Shaw, Edson, And Bell, 1960; Barret, 1957; Bruck, 1946; Conklin, 1940; Bruck and Bodwin, 1962; Roth, 1959; Brislow, 1962; Borg, 1964; Martire, 1956; Payne and Farquhar, 1962;

Benjamins, 1950; Davids, 1955), economic factors (Anastasi, 1963), and environmental factors (Tyler, 1959, 1961; Landsman, 1962; Combs and Snygg (1959). The extent of these influences varies with different individuals as has been discussed in the preceding chapters. Better academic achievement resulting from programed instruction (Little, 1934; Hough, 1962; Ferester and Sapon, 1959; McNamara and Hughes, 1961; Porter, 1959; Calvin, 1960; Probst, 1962; Moore and Smith, 1961; Norman, 1962; Barcus, Hayman, and Johnson, 1964, Marmor, 1963; Curry, 1963; Stolurow, 1962) is but one of the many factors which may contribute to the better development of one's self-concept and/or acceptance-of-self. Secondly, programed instruction, as has been offered during the present study, was extremely limited in time and depth. Only one complete English course was offered. Thirdly, the time that the F-1 students were exposed to programed instruction was especially limited - one semester. In consideration of the foregoing reasons, one may not expect the self-acceptance of the subjects involved to be changed permanently after one semester of programed instruction. A comparison between the first (124.40) and third (129.60) mean self-acceptance scores did show a small increment though not statistically significant. The small increment may indicate the lingering effect of programed instruction on self-acceptance or it may be the result of maturation or merely chance. The discovery that acceptance-of-self scores reverted after a semester of traditional instruction nonetheless seems to strengthen rather than to weaken the reason to reject the hypothesis as this finding exhibits the immediate effect of programed instruction on the learner's acceptance-of-self.

Group F-II. Similar to the findings associated with Group F-I, the results obtained from F-II group data analysis also revealed that the students' self-acceptance was enhanced (approaching .05 level) after one semester of programed instruction (English 2600), while during the period of time with no programed instruction self-acceptance remained relatively stable. The hypothesis must be accepted but by an extremely narrow margin. A comparison between the first (September, 1963) and the third (May, 1964) mean self-acceptance scores was made and a significant (.01 level) increment was found. This increment, however, has little meaning in relation to other findings, since the F-II students had programed instruction only during the second semester. The discovery of the F-II students' relative stability in acceptance-of-self after the first semester under traditional instruction is crucial to the finding of the enhancement of self-acceptance after programed instruction during the second semester of this study.

Group F-III. Although the results related to Group F-III are not directly related to the hypothesis, they are important to the foundation of the present study. It has been mentioned in Chapter III, under the section on statistical analysis, that single-group design is not suitable for studies where the dependent variable is not stable. The results related to Group F-III, that group which received no programed instruction during the academic year of this study, indicate that these students' acceptance-of-self remained at about the same level throughout the academic year. These findings further substantiate the stability of the 9th graders' self-acceptance under traditional instruction as confirmed by the results obtained from Groups F-I and F-II.

One may aruge that the self-acceptance scores of the F-III subjects have remained almost constant because of their low average intellectual level (94.25) and academic attainment (1.76 grade-point average). Previous research has shown that self-concept is positively correlated with intelligence (Anastasi, 1963, Gorlow, 1963) and achievement (Gorlow, 1963; Shaw, Edson, and Bell, 1960; Bruck, 1946; Conklin, 1940; Bruck and Bodwin, 1962; Roth, 1959; Brislow, 1962; Borg, 1964; Payne and Farquhar, 1962). The students composing Group F-III had the lowest average IQ and grade-point average of all the freshmen groups, yet exposed the highest self-acceptance scores of any of the freshmen groups. One possible explanation for this disclosure may be found in the high mean chronological age or greater proportion of females in the group. Previous research has revealed that self-concept increases with age (Washburn, 1961; Bruck, 1946; Perkins, 1958) and is greater with females at the high school level (Bruck, 1946; Shaw, Edson and Bell, 1960; Washburn, 1961). Another possible explanation for this finding is that while these students reported, consciously or unconsciously, a very definitely positive respect for self, they did so merely to protect their ego. That is, they purposely reported a spuriously high acceptance of self.

Group J-IV. Group J-IV received programed instruction (edl word clues) during the first as well as the second semester of the current study. No significant increment in acceptance-of-self was obtained between the first (137.45) and second (140.18), and second (140.18) and third (143.72) mean scores. However, a near significant (approaching .05 level) increment was found between the first (137.45) and third (143.77) self-acceptance scores. In other words, the self-acceptance scores of the J-IV group had been

somewhat enhanced after two semesters of programed instruction, but not after but one semester of programed instruction. The results related to Group J-IV provide a deeper insight into programed learning - its steady and increasing positive effect on the self-acceptance of high school students.

Group J-V. The J-V group received traditional instruction during both semesters of the present investigation. No significant differences were discovered between any mean self-acceptance scores, which indicated that the students' acceptance-of-self remained relatively constant during the course of one academic year. The stability of the self-acceptance scores of Group J-V carries the same significance as that of Group F-III. This finding further substantiates the stability of the subjects' acceptance-of-self during the current study.

The stability of the self-acceptance scores of Group J-V may be a consequence of their originally high self-acceptance scores together with their slightly higher-than-Group J-IV mean IQ, grade-point average, and chronological age, which may minimize the fluctuation of acceptance of self. Furthermore, the J-V group had a relatively high percentage of females. Bruck (1946), Shaw, Edson and Bell (1960), and Washburn (1961) have disclosed that high school girls possess beteer self-concepts than boys and better self-concepts reflect higher stability as shown by Brownfain (1952).

General Discussion. The findings of the present study have suggested a positive effect of programed instruction on the self-acceptance of the high school students involved. The effect of programed instruction has been examined at different times: first, second, and both semesters of the academic year during which this study was undertaken. The effect of programed

instruction has also been examined at different academic levels: freshman and junior. The effect of programed instruction, lastly, has been examined under different treatments: English 2600 and edl word clues. It has been pointed out that the single-group design is inappropriate for research when the dependent variable is not stable or likely to be affected by maturation. It is therefore important for the subjects' acceptance-of-self under non-programed treatment to be stable in order to determine the outcoming effect of programed instruction. The findings have somewhat confirmed the stability of self-acceptance over a period of one academic year. The enhancement of self-acceptance might here be attributed to the effect of programed instruction although certain contaminating factors may prevent a clear-cut conclusion.

Groups F-I and F-II both received programed instruction for one semester, but the former's self-acceptance was enhanced to a greater level (.02 level) than the latter's (approaching .05 level) as revealed by t-test analysis. Following are some of the possibilities for the discovered results. First, the individual differences between the freshmen groups (F-I and F-II) may have affected the findings. Although the variables of intelligence and chronological age between the two groups are similar, academic achievement and sex distribution were found to be significantly different. The greater increment of acceptance of self shown by Group F-I over Group F-II after programed instruction may be the consequence of higher achievement by the former. Regarding the sex difference, Group F-I had a significantly higher percentage of female students than Group F-II. Shaw, Edson, and Bell (1960), Bruck (1946), and Washburn (1961) have proposed that high school girls have a more mature and better adjusted self-concept

than do boys of the same level. The girls' self-concepts and/or self-acceptance, then, may be increased to a greater extent than the boys' self-acceptance after programed instruction. Further, other personal factors such as socio-economic and family background may be significantly different between the two groups. The crucial influences of socio-economic level (Anastasi, 1963), environment and experiences (Tyler, 1959, 1961; Landsman, 1962; Combs and Snygg, 1959) in shaping an individual's self-concept have been proposed. Secondly, the time during the academic year that programed instruction was offered may affect the degree of increment of the students' reported acceptance of self. The F-I subjects received programed instruction during the first semester, whereas the F-II subjects received programed instruction during the second semester. Also, the novelty factor may cause a greater gain in acceptance-of-self. The possibility of novelty effect leading to higher achievement in programed instruction has been suggested by Calvin (1960). The F-I group may have viewed programed instruction as somewhat of a novelty since they were the first group to use this media in the high school involved in this study. Group F-II had some acquaintance with this "novelty" prior to receiving programed instruction. Thirdly, test differences may produce a difference in acceptance-of-self. Group F-I received programed instruction with two programs: English 2600 and edl word clues. Group F-II used English 2600 only and Group J-IV used edl word clues only. Also, the effectiveness of edl word clues still remains to be evaluated. Text difference, in quality as well as quantity, may be another variable contributing to the different degrees of increment in students' reported acceptance-of-self. Finally, the reader should recognize that the present study is limited because of the small sample size.

Covariance analysis, discussion

Much of the discussion under single-group analysis also applies to the results discussed in the following section of this report. Such is particularly true as relates to supporting literature cited. Therefore, the following discussion will omit the citation of supporting literature.

Groups F-I and F-II. The expected significant difference in self-acceptance after the first semester did not materialize. However, those students (F-I) receiving programed instruction (English 2600 and edl word clues) did show a marked advancement in reported self-acceptance. The second semester comparison exposed a significant (.01 level) difference in self-acceptance with those students (F-II) receiving programed instruction (English 2600) making a noted gain in self-acceptance. However, the significant difference may in part be due to the rather large decrement in self-acceptance of the F-I group rather than a decided increment in self-acceptance of the F-II group.

Groups F-I and F-III. Those students (F-I) receiving programed instruction (English 2600 and edl word clues) during the first semester reported a significantly (.01 level) higher advancement in self-acceptance than did those students (F-III) receiving traditional instruction It might be concluded from this finding that indeed programed instruction has a positive effect on a student's acceptance-of-self. However, the second semester comparison of these groups when both received traditional instruction somewhat nullifies the foregoing conclusion because a significant (.05 level) difference in self-acceptance was again noted. As with the comparison of Groups F-I and F-II, this significant difference may be a result of the great decrement in self-acceptance of the F-I group during the second semester.

Groups F-II and F-III. The significant (.05 level) difference in self-acceptance found when comparing the F-II group receiving programed instruction (English 2600) with the F-I group receiving traditional instruction during the second semester further substantiates the theory that programed instruction enhances self-acceptance.

Groups J-IV and J-V. The fact that no significant difference in self-acceptance was discovered between the group (J-IV) receiving programed instruction (edl word clues) during the entire academic year of this study and the group (J-V) receiving traditional instruction during this same period of time may be explained on the basis that the edl word clues program was offered but several times a week and may thus have had a lesser impact on a student's reported self-acceptance than the more estensively used program (English 2600).

Groups F-I and F-II - F-III. The significant (.05 level) difference in self-acceptance between the group (F-I) receiving programed instruction (English 2600 and edl word clues) and the group (F-II - F-III) receiving traditional instruction during the first semester lends support to the belief that programed instruction exerts a positive effect on self-acceptance.

Groups F-II and F-I - F-III. The significant (.01 level) difference in self-acceptance between the F-II group who received traditional instruction during the second semester further substantiates the hypothesis that programed instruction enhances self-acceptance.

Sex differences. In only one sex group comparison was a significant difference in self-acceptance noted. The F-II boys who received programed instruction (English 2600) during the second semester expressed a

significantly (.01 level) higher self-acceptance rating than did the F-I - F-III boys who received traditional instruction during this same period of time. One explanation for this result might be that programed instruction influences boys' self-acceptance rating to a greater degree than it influences girls' self-acceptance ratings. A comparison of F-II girls with F-I - F-III girls was not completed because only one member of the F-II group was a female. Had such a comparison been completed and had a significant difference in self-acceptance been discovered, the rationale for the difference in self-acceptance between the boys of these two groups would be nullified.

Groups F-I and J-IV. A comparison between Group F-I who received traditional instruction during the second semester and Group J-IV who received programed instruction (edl word clues) during both semesters of this study revealed an insignificant difference in reported self-acceptance. This result may again be based on the fact that the edl word clues program received by the J-IV group was not offered on a daily basis while English 2600 was offered daily and in a more systematic fashion.

Groups F-I and J-V. A comparison of the group (F-I) receiving programed instruction (English 2600 and edl word clues) during the first semester of this study with a group (J-V) receiving traditional instruction during the same period of time exposed a significant (.05 level) difference in reported self-acceptance. Once again the theory that programed instruction promotes greater self-acceptance is supported.

Groups F-II and J-IV. A significant difference in the self-acceptance of the members of these two groups did not materialize. Group F-II received traditional instruction during the first semester while Group J-IV received programed instruction (edl word clues) during this same period of time. The

absence of a significant difference may again be explained on the basis of the infrequency with which edl word clues was offered. During the second semester of this group comparison, students of Group F-II worked with English 2600 while members of Group J-IV received instruction in edl word clues. The absence of a significant difference in self-acceptance between these two groups may be attributed to the fact that both groups received programed instruction. The group which received instruction employing English 2600, Group F-II, reported a greater increase in self-acceptance than did the comparison group, Group J-IV, which worked on the edl word clues program. Although the difference in reported self-acceptance between these two groups did not prove significant, the indication might be that the English 2600 program has greater influence than the edl word clues program on one's self-acceptance. Perhaps the daily experience with English 2600 tended to promote a greater feeling of a "personal program" among students than did the sporadic exposure to edl word clues.

Groups F-II and J-V. The first semester of the current study found both Group F-II and Group J-V receiving traditional instruction. The second semester of this investigation found the students of Group F-II reviewing English 2600. A significant (.01 level) difference in reported self-acceptance between these groups during the second semester was discovered. The reader might note that when students engaged in study with English 2600 are compared with students not involved in programed instruction or if so engaged are using edl word clues a difference in acceptance of self is evident. These findings should point to the possible influence English 2600 might exert on self-acceptance.

Groups F-III and J-IV. Group F-III received traditional instruction during both semesters of the current study while Group F-IV received programed

instruction (edl word clues) during both semesters of the study. No significant difference in self-acceptance was detected. The edl word clues program appeared to have little effect in advancing self-acceptance. In each instance when edl word clues was the program employed, self-acceptance appeared to have made little gain. Once again, however, the reader is cautioned not to accept this finding at face value. It might be noted that those students using the edl word clues exhibited a small but steady gain in self-acceptance. Such a gain in self-acceptance was not noted when no programed instruction was offered.

Groups F-III and J-V. Both Groups F-III and J-V received traditional instruction throughout the course of this study No significant difference was found. Such a discovery may be interpreted to mean that a student's acceptance-of-self remains relatively constant when uninfluenced by programed instruction. As previously indicated, both the English 2600 and edl word clues programs tend to be associated with an advancement in self-acceptance. Such an advancement in self-acceptance was not observed when traditional instruction was employed. The finding related to the comparison of Groups F-III and J-V further lends support to the theory that programed instruction may enhance acceptance-of-self.

Groups F-I - F-III and J-IV. A second semester comparison of these groups when Group F-I - F-III received traditional instruction and Group J-IV received programed instruction (edl word clues) revealed an insignificant difference in reported self-acceptance. The absence of a significant self-acceptance gain might be attributed to the limited influence of the edl word clues program on self-acceptance or to the large decrement in self-acceptance offered by the F-I group or both.

Groups F-I - F-III and J-V. A second semester comparison of these two groups when neither received traditional instruction revealed no significant difference in reported self-acceptance. Since neither of these groups received programed instruction and no significant difference in self-acceptance was noted, further verification of the importance of programed instruction on self-acceptance might be inferred.

Groups F-II - F-III and J-IV. One group (F-II - F-III) of this comparison received traditional instruction during the first semester while the second group (J-IV) received programed instruction (edl word clues) during this same period of time. No significant difference in self-acceptance was discovered. The limited influence of the edl word clues program on self-acceptance is again displayed. The reader is once again reminded that the edl word clues was not employed on a daily basis and thus may not be expected to exert the degree of influence on self-acceptance that might be expected had this program been used daily.

Groups F-II- F-III and J-V. Neither group of this comparison received programed instruction during the first semester of the present study and therefore a significant difference in self-acceptance was not anticipated. Furthermore, no such difference was discovered. The fact that no significant difference in acceptance of self was noted between these groups might lead one to believe that self-acceptance remains rather constant when uninfluenced by programed instruction.

Groups F-I - J-IV and F-II - F-III - J-V. A comparison of the first group (F-I - J-IV) which received programed instruction (English 2600 and edl word clues) during the first semester with the second group (F-II - F-III - J-IV) which received traditional instruction during this same period of time revealed no significant difference in reported self-acceptance. This finding is not congruent with other findings of this study.

Groups F-II - J-IV and F-I - F-III - J-V. A comparison of the first group (F-II - J-IV) which received English 2600 and edl word clues programs during the second semester of the current study with the second group (F-II - F-III - J-IV) which received traditional instruction during the second semester revealed a difference in acceptance-of-self which approached but did not reach the 5 per cent level of confidence. Once again it may be inferred that programed instruction influences positively one's acceptance-of-self.

General Discussion. Much of the discussion under single-group analysis also applies to covariance analysis and will not again be discussed in the following section of this paper.

It has been suggested in Chapter I that self-acceptance may be enhanced because of greater academic achievement resulting from programed instruction. Another factor which may contribute to the advancement of self-acceptance is the possible effect of independent study. Programed instruction may permit the student to work independently and frequently at his own desired rate of speed. Such independence from "teacher domination" may promote a more healthy acceptance-of-self.

The findings of the present study seem to indicate that programed instruction does have a positive effect on acceptance-of-self. However, the effect of programed instruction of self-acceptance may be only temporary as hinted by the reversion of self-acceptance among the members of Group F-I after a semester of programed instruction followed by a semester of traditional instruction.

Analysis by covariance appears to have revealed a rather consistent finding: The English 2600 program exerted a greater influence on acceptance-of-self than did the edl word clues program. This statement should not be

interpreted to mean that the edl word clues program is of little value in promoting self-acceptance. It should be recalled that the edl word clues program was used more sparingly in this study than was the English 2600 program. Had the edl word clues program been used as frequently as was the English 2600 program, the former may have exerted an equal influence on acceptance-of-self.

A significant difference in acceptance-of-self was discovered in eight of ten comparisons involving both sexes when programed instruction employing English 2600 was offered one group and traditional instruction offered the comparison group. In each instance the group receiving programed instruction recorded a marked advancement in self-acceptance.

Will students' acceptance of self be enhanced to a greater extent with more courses in programed instruction? Will the increment of self-acceptance last longer or even permanently with longer terms of programed instruction? Will similar findings be obtained with larger and more varied samples? These questions, together with those relating to novelty effect, feeling of self-accomplishment, sex, and text differences can only be answered by further research.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

Programed instruction and self-concept have been familiar subjects in the domain of education and psychology during the past decade. A review of recent literature, however, disclosed to the writers that no research had yet been undertaken concerning the relationship between programed instruction and the learner's acceptance of self. The current study, therefore, was launched to test the hypothesis that there would be no significant difference in self-acceptance of high school students after receiving programed instruction.

A sample of eighty high school freshmen and juniors of both sexes were involved in the study. The students were randomly divided into five groups at the beginning of the academic year: three freshmen groups (F-I, F-II, and F-III) and two junior groups (J-IV and J-V). F-I subjects received programed instruction (English 2600 and edl word clues) during the first semester and traditional instruction in English during the second semester. F-II students received traditional instruction in English the first semester and programed instruction (English 2600) the second semester. The F-III students were not exposed to programed instruction. The J-IV group had programed instruction (edl word clues) during the first and second semesters of the current investigation. The members of Group J-V received traditional instruction in English throughout the academic year during which this investigation was undertaken.

Two programed textbooks were employed in this study. Either English 2600 or edl word clues or both were used with the programed groups, whereas

the control groups used conventional English textbooks. The High School Form of Bills' Index of Adjustment and Values (the "Self" form) was employed to obtain the subjects' self-acceptance, which was measured three times: at the beginning of the academic year (September), at the end of the first semester (January), and at the termination of the second semester (May). The t-tests for correlated and for independent observations and analysis of covariance were used to analyze the obtained data.

General Conclusions

In view of the present findings, it might be concluded that programed instruction in English enhances the learner's self-acceptance. However, the writers must hasten to point out that this increment in acceptance of self might well be temporary rather than permanent. The writers caution the reader about fully accepting the findings of this study until further research is complete. With the foregoing admonition in mind the following suggestions are proffered:

1. Programed instruction may positively influence acceptance of self.

   A. English 2600 may help to promote a more positive acceptance of self.

   B. edl word clues may exert a lesser but nonetheless positive influence on acceptance of self.

Programed instruction is in its early stage of development, particularly as it relates to self-concept and/or self-acceptance. It is, therefore, hoped that the conclusions revealed by this study be regarded as suggestive rather than definitive. Only in this manner can more research be stimulated and consequently more valuable findings disclosed. Should the current paper serve as the threshold for further investigations of the relationship between programed instruction and self-acceptance, its purpose will have been attained.

BIBLIOGRAPHY

BIBLIOGRAPHY

Adler, A., The Neurotic Constitution. New York: Moffat, Yard, 1921.

Anastasi, A. Psychological Testing (2nd Ed.), New York: Macmillan, 1963.

Arnholter, E.G. "School Persistance and Personality Factors," Personnel and Guidance Journal, 35:107-109, 1956.

Barcus, D., J.L. Hayman, Jr., and J.T. Johnson, Jr., "Programing Instruction in Elementary Spanish," Educational Technology, (Ed. by John P. DeCecco), New York: Holt, Rinehart and Winston, 1964, pp. 423-430.

Barret, H.O., "An Intensive Study of 32 Gifted Children," Personnel and Guidance Journal, 36;192-194, 1957.

Benjamins, J., "Changes in Performance in Relation to Influences Upon Self-Conceptualization," Journal of Abnormal and Social Psychology, 45:473-480, 1950.

Berger, E.M., "The Relation Between Expressed Acceptance of Self and Expressed Acceptance of Others," Journal of Abnormal and Social Psychology, 47:778-782, 1952.

Bills, R.E., Vance, E.L., and McLean, O.S., "An Index of Adjustment and Values," Journal of Consulting Psychology, 15:257-261, 1951.

Bills, R.E., Manual, Index of Adjustment and Values, (undated).

Blumenthal, J.C., English 2600 (Rev. Ed.), New York: Harcourt, Brace and World, 1962.

Blyth, J.W., "Teaching Machines and Human Beings," Educational Record, XLI:116-125, 1960.

Borg, W.R., Educational Research, New York: David McKay Company, 1963.

Borg, W.R., An Evaluation of Ability Grouping, Cooperative Research Project No. 577, Utah State University, Logan, Utah, 1964.

Brislow, B., "Self-Evaluation and Academic Achievement," Journal of Counseling Psychology, 9:246-254, 1962.

Brownfain, J.J., "Stability of Self-Concept as a Dimension of Personality," Journal of Abnormal and Social Psychology, 47:597-606, 1952.

Bruck, M., "A Study of Age Difference and Sex Difference in the Relationship Between Self-Concept and Grade-Point Average," Dissertation Abstract, 1959, 19, 1946.

Bruck, M. and Bodwin, F., "The Relationship between Self-Concept and the Presence and Absence of Scholastic Underachievement," Journal of Clinical Psychology, 18:181-182, 1962.

Calvin, A., "A Demonstration Class Using Teaching Machines for Ninth-Grade Algebra," Roanoke, Virginia: Hollins College, 1960.

Chodorkoff, B., "Adjustment and the Discrepancy between the Perceived and Ideal Self," Journal of Clinical Psychology, 10:266-268, 1954.

Combs, A. W. and D. Snygg, Individual Behavior, New York: Harper and Brothers, 1959.

Conklin, A. N., Failures of Highly Intelligent Pupils, New York: Bureau of Publications, Teachers College, Columbia University, 1940.

Cornebise, J. M., "The Self: A Concern of the Teacher," High School Journal, 46:189-194, 1963.

Curry, T., "Teaching English by Programmed Instruction: English 2600," National Catholic Educational Association Bulletin, 60:322-326, 1963.

Davids, A., "Some Personality and Intellectual Correlations of Intolerance of Ambiguity," Journal of Abnormal and Social Psychology, 51:415-420, 1955.

DeCecco, J. P. (Ed.), Educational Technology: Readings in Programed Instruction, New York: Holt, Rinehart and Winston, 1964.

Edwards, A. L. Statistical Analysis (Rev. Ed.), New York: Rinehart, 1959.

Eigen, L. D. and J. F. Feldhusen, "Interrelationships among Attitude, Achievement, Reading, Intelligence, and Transfer Variables in Programed Instruction," Educational Technology (Ed. by John P. DeCecco), New York: Holt, Rinehart and Winston, 1964, pp. 376-386.

Evans, J. L., R. Glaser, and L. E. Homme, "An Investigation of 'Teaching Machine' Variables Using Learning Programs in Symbolic Logic," Journal of Educational Research, 55:433-452, 1962.

Ferester, C. D., and S. M. Sapon, "An Application of Recent Developments in Psychology in Teaching German," Harvard Education Review, 29:58-69, 1959.

Field, F. L. and Others, "The Self-Concept in Career Development: A Construct in Transition," Personnel and Guidance Journal, 41:767-771, 1963.

Filep, R. T., "Programmed Instruction: A Quite Life?" National Catholic Educational Association Bulletin, 60:317-322, 1963.

Finn, J. D., "Teaching Machines: Auto-instructional Devices for the Teacher," Educational Technology (Ed. by John P. DeCecco), New York: Holt, Rinehart and Winston, 1964, pp. 13-21.

Fromm, E., "Selfishness and Self-Love," Psychiatry, 2:507-523, 1939.

Fromm, E., Man for Himself, New York: Rinehart, 1947.

Fry, E. B., "Teaching Machines: The Coming Automation," Educational Technology (Ed. by John P. DeCecco), New York: Holt, Rinehart and Winston, 1964, pp. 21-27.

Fry, E. B., Teaching Machines and Programmed Instruction, New York: McGraw-Hill Book Company, 1963.

Getzels, J. W. and P. W. Jackson, The Highly Intelligent and the Highly Creative Adolescent: A Summary of Some Research Findings in the Third University of Utah Research Conference on the Identification of Creative Scientific Talent, June, 1959 (mimeographed).

Gordon, I. J., "The Child's Self," The Teacher as a Guidance Worker, New York: Harper and Brothers, 1956.

Gore, L. L., "Learning to See Themselves," Education, 81:7-10, 1960.

Gerlow, L. L. and Others, "Correlates of Self-Attitudes and Retardates," American Journal of Mental Deficiency, 67:549-555, 1963.

Griffin, W. J. and K. D. Knudson, "Teaching Machines and Programmed Textbooks in the High School English Curriculum," High School Journal, 45:218-224, 1962.

Herriott, R. E., "Some Social Determinants of Educational Aspirations," Harvard Educational Review, 33:157-177, 1963.

Hilgard, E. R., "Human Motives and the Concept of the Self," American Psychologist, 4:374-384, 1949.

Hopkins, L. T., The Emerging Self, New York: Harper and Brothers, 1954.

Horney, K., The Neurotic Personality of Our Time, New York: Horton, 1937.

Horney, K., New Ways in Psychoanalysis, New York: Norton, 1939.

Hough, J. B., "An Analysis of the Efficiency and Effectiveness of Selected Aspects of Machine Instruction," Journal of Educational Research, 55:461-471, 1962.

Jersild, A. T., In Search of Self, New York: Bureau of Publications, Teachers College, Columbia University, 1952.

Jervis, F. M., "The Meaning of a Positive Self-Concept," Journal of Clinical Psychology, 15:370-373, 1959.

Kipnis, D. M., "Changes in Self-Concepts in Relation to Perceptions of others," Journal of Personality, 29:449-465, 1961.

Klaus, D. J., "The Art of Auto-instructional Programming," Educational Technology (Ed. by John P. DeCecco), New York: Holt, Rinehart and Winston, 1964, pp. 35-50.

Landsman, T., "The Role of the Self-Concept in Learning Situations," High School Journal, 45:289-295, 1962.

Lecky, P., Self-Consistency: A Theory of Personality, New York: Island Press, 1945.

Leese, J., "Highlights on Research on Teaching and Learning," High School Journal, 45:314-322, 1962.

Lepine, L. T. and B. Chodorkoff, "Goal Setting Behavior, Expressed Feelings of Adequacy and the Correspondence between the Perceived and Ideal Self," Journal of Clinical Psychology, 11:395-397, 1955.

Little, J. K., "Results of the Use of Machines for Testing and for Drill, upon Learning in Educational Psychology," Journal of Experimental Education, 111:45-49, 1934.

Loevinger, J. and A. G. Ossorio, "Evaluation of Therapy by Self-Report: A Paradox," American Psychologist, 13:366, 1958.

Marmor, I., "The Teacher and English 2600 Make a Good Pair," Audiovisual Instruction, 8:402-403, 1963.

Marriman, E., "Teaching Modern Mathematics by Programmed Instruction," National Catholic Educational Association Bulletin, 60:326-331, 1963.

Martire, J. G., "Relationships between the Self-Concept and Differences in the Strength and Generality of Achievement Motivation," Journal of Personality, 24:364-375, 1956.

Mills, A. L. (Ed.), Programed Learning and the Educational Process, New York: Thomas Alva Edison Foundation, 1962.

Moore, J. W. and W. I. Smith, "Knowledge of Results in Self-Teaching Spelling," Psychological Reports, 9:717-726, 1961.

Moustakas, C. E. (Ed.), The Self, New York: Harper and Brothers, 1956.

Murphy, G., "New Vistas in Personality Research," The Personnel and Guidance Journal, XL:114-122, 1961.

McNamara, W. J. and J. Hughes, "I.B.M.'s Experience in Developing Programmed Instruction," Programmed Learning: Evolving Principles and Industrial Applications (Ed. by H P Lysaught), Ann Arbor: The Foundation for Research in Human Behavior, 1961, pp. 53-57.

Norman, H. S., "The Teaching of Elementary Statistics by the Conventional Classroom Method Versus the Method of Programmed Instruction," Journal of Educational Research, 55:415-420, 1962.

Payne, D. A. and W. W. Farquhar, "The Dimensions of an Objective Measures of Academic Self-Concept," Journal of Educational Psychology, 53:187-192, 1962.

Perkins, H. V., "Factors Influencing Change in Children's Self Concepts," Child Development, 29:221-230, 1958.

Phillips, B. N., F. Hindeman, and E Jennings, "Influences of Intelligence on Anxiety and Perception of Self and Others," Child Development, 31:41-46, 1960.

Phillips, E. L., "Attitudes Toward Self and Others: A Brief Questionnaire Report," Journal of Counsulting Psychology, 15:79-81, 1951.

Porter, D., "Some Effect of Year Long Teaching Machine Instruction," Automatic Teaching: The State of the Art (Ed., by Eugene Galenter), New York: John Wiley and Sons, 1959, pp. 85-90.

Probst, G. E. (Ed.), Programed Learning in the Schools: Tasks for 1962, New York: Thomas Alva Edison Foundation, 1962.

Raimy, V. C., "Self-Reference in Counseling Interviews," Journal of Consulting Psychology, 12:243-248, 1948.

Reed, J. E. and J. L. Hayman, "An Experiment involving Use of English 2600, an Automated Instruction Text," Journal of Educational Research, 55:476-484, 1962.

Rogers, C. R., Client-Centered Therapy, Boston: Houghton Miflin, 1951.

Roth, R. M., "The Role of Self-Concept in Achievement," Journal of Experimental Education, 27:265-281, 1959.

Scheerer, E. T., "An Analysis of the Relationship between Acceptance of and Respect for Self Acceptance of and Respect for Others in Ten Counseling Cases," Journal of Counsulting Psychology, 13:169-175, 1949.

Shay, C. B., "Relationship of Intelligence to Step Size on a Teaching Machine Program," Journal of Educational Psychology, 52:98-103, 1961.

Shaw, M. C., K Edson, and H. M. Bell, "The Self-Concept of Bright Underachieving High School Students as Revealed by an Adjective Check List," Personnel and Guidance Journal 39:193-196, 1960.

Skinner, B. F., "Why We Need Teaching Machines," Harvard Educational Review, 31:377-398, 1961.

Steiner, I. D., "Self-Perception and Goal Setting Behavior," Journal of Personality, 25:344-355, 1957.

Stock, D , "An Investigation into the interrelations between the Self-Concept and Feelings Directed toward Other Persons and Groups," Journal of Consulting Psychology, 13:176-180, 1949.

Stolurow, L M., "Implications of Current Research and Future Trends," Journal of Educational Research, 55:519-527, 1962.

Stolurow, L. M., "Social Impact of Programmed Instruction: Aptitudes and Abilities Revisited," Educational Technology (Ed. by John P. DeCecco), New York: Holt, Rinehart and Winston, 1964, pp. 348-355.

Taylor, S E. and others, edl word clues (Bk. G), New York: Educational Developmental Laboratories, 1962.

Tyler, L. E., "Toward a Workable Psychology of Individuality," American Psychologist, 14:78-81, 1959.

Tyler, L. E., "Research Explorations in the Realm of Choice," Journal of Counselling Psychology, 8:195-201, 1961.

Washburn, W. C., "Patterns of Self-Conceptualization in High School and College Students," Journal of Educational Psychology, 52:123-131, 1961.

APPENDIX A

The Index of Adjustment and Values*

(High School Form)

Name_____

School_____ Grade_____
(Please print plainly)

"SELF"

		I	II	III			I	II	III
a.	JOLLY	___	___	___	19.	kind	___	___	___
1.	active	___	___	___	20.	loyal	___	___	___
2.	alert	___	___	___	21,	neat	___	___	___
3.	carefree	___	___	___	22.	obedient	___	___	___
4.	cheerful	___	___	___	23.	patient	___	___	___
5.	considerate	___	___	___	24.	playful	___	___	___
6.	cooperative	___	___	___	25.	polite	___	___	___
7.	courteous	___	___	___	26.	quiet	___	___	___
8.	dependable	___	___	___	27.	sharing	___	___	___
9.	democratic	___	___	___	28.	sincere	___	___	___
10.	faithful	___	___	___	29.	studious	___	___	___
11.	friendly	___	___	___	30.	sociable	___	___	___
12.	generous	___	___	___	31.	tactful	___	___	___
13.	happy	___	___	___	32.	thoughtful	___	___	___
14.	helpful	___	___	___	33.	thrifty	___	___	___
15.	honest	___	___	___	34.	trustworthy	___	___	___
16,	humorous	___	___	___	35.	truthful	___	___	___
17.	intelligent	___	___	___	36.	understanding	___	___	___
18.	interesting	___	___	___	37.	unselfish	___	___	___

THE INDEX OF ADJUSTMENT AND VALUES

(Continued)

COLUMN I

1. Seldom, is this like me.
2. Occasionally, this is like me.
3. About half of the time, this is like me.
4. A good deal of the time, this is like me.
5. Most of the time, this is like me.

COLUMN II

1. I very much dislike being as I am in this respect.
2. I dislike being as I am in this respect.
3. I neither dislike being as I am nor like being as I am in this respect.
4. I like being as I am in this respect.
5. I like very much being as I am in this respect.

COLUMN III

1. Seldom, would I like this to be me.
2. Occasionally, I would like this to be me.
3. About half of the time, I would like this to be me.
4. A good deal of the time, I would like this to be me.
5. Most of the time, I would like this to be me.

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