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ABSTRACT

The research reported in this monograph was conducted as a part of the longitudinal Vocational Development Study (VDS) undertaken by the Department of Vocational Education at Pennsylvania State University. The purpose of this project is to conduct ongoing longitudinal research focused upon uncovering the effects of the senior high school experience upon the development of youth. In the present study, comparisons are made between ninth and twelfth grade measures of occupational values, vocational maturity, post high school educational plans, and multiple aptitudes. The study examines the effects of both time and curriculum, thus contributing to both basic and applied vocational development research needs. The vocational development theorists would find the stability of the measured characteristics of most interest, while counselors and those involved in curriculum development would find the information concerning student characteristics and curricular involvement of particular value. (Author)

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THE PENNSYLVANIA STATE UNIVERSITY
DEPARTMENT OF VOCATIONAL EDUCATION

# CHANGE IN SELECTED CHARACTERISTICS OF STUDENTS BETWEEN NINTH AND TWELFTH GRADE AS RELATED TO HIGH SCHOOL CURRICULUM

ROBERT E. STRICKLER

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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# Change in Selected Characteristics of Students Between Ninth and Twelfth Grade as Related to High School Curriculum

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Pennsylvania Department of Education
Bureau of Vocational, Technical and Continuing Education
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# PREFACE

The research reported in this monograph was conducted as a part of the longitudinal Vocational Development Study (VDS) which has been underway in the Department of Vocational Education at the Pennsylvania State University since the Fall of 1968. The project was begun by the late Dr. Joseph T. Impellitteri and has been supported by Pennsylvania's Research Coordinating Unit (RCU) in Vocational Education. The purpose of this project is to conduct ongoing longitudinal research focused upon uncovering the effects of the senior high school experience upon the development of youth.

The study reported herein was designed to examine the change which occurred in selected characteristics of students over the high school years as they relate to the students' curriculum. In this study, Strickler has attempted to exploit the usefulness of longitudinal data by comparing ninth and twelfth grade measures of occupational values, vocational maturity, post high school educational plans and multiple aptitudes. In examining the effects of both time and curriculum, this study makes a major contribution to both basic and applied vocational development research needs. The vocational development theorist may find the stability of the measured characteristics of most interest, while counselors and those involved in curriculum development could find applications for the information uncovered concerning student characteristics and curricular involvement.

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## VDS CAPSULE

This section has been included in order to provide a brief summary of the findings and implications of this study. Educators, researchers and other interested parties hopefully can determine through this capsule whether or not the full report warrants their investigation.

This is a study of high school age students which examines various affective changes that occur in these students from ninth to twelfth grade. The effects that both time and curriculum has had upon these changes are investigated in this research effort. A brief description of the major findings is followed by a listing of some of the possible implications which may be drawn as a result of the findings.

### Findings

1. The occupational value structure of students remained fairly stable from ninth to twelfth grade, but the differential between the highest and the lowest value score increased during this time period.

2. Students' vocational maturity scores generally increased from ninth to twelfth grade.

3. The number of students who had post high school educational plans which included attending college decreased from 51% in ninth grade to 42% in the twelfth grade.

4. For Vocational students, GATB aptitude scores increased from ninth to twelfth grades, and the twelfth grade mean scores were above the GATB General Working Population Sample mean of 100 with the exception of GATB-V. The variability of GATB scores also increased, and the correlation between ninth and twelfth grade scores was fairly high.

5. The results of this study indicate that the student characteristics studied become more diverse over the high school years.

6. Changes which occur in students' occupational values, vocational maturity and post high school educational plans seemed to be due largely to the effect of time, and to a much lesser extent, was effected by the curriculum in which the student was enrolled. In some instances curriculum did seem to play a major role.

7. Students who enroll in a curriculum which is designed to train for entry into generally familiar careers (e.g. Home Economics) tend to alter their value structure less than those who enroll in a curriculum which will prepare students for vaguely familiar careers (e.g. Academic).

8. Although this study dealt mainly with changes which occurred in affective measures, the change in aptitudes over the same time period was used as a comparative standard. Changes in the affective and cognitive domains seem to be congruent through the high school years.

Implications

1. Since the occupational value structure of high school students is fairly stable from ninth to twelfth grade, a survey of a student's values would be a reliable and useful counseling tool during the high school years.

2. Since students were more vocationally mature in twelfth grade than they were in the ninth grade, it would be expected that students could make better career decisions later in their high school program. Therefore, a choice of a specific occupationally oriented curriculum should not be mandated at a particular point in time, and for some students specific career decisions should not be made during the high school years.

3. At least 38% of students enrolled in any one curriculum, in this study, did not plan to attend college upon high school graduation. Therefore, occupational skills should be taught as an integral part of all curricula.

4. Since the correlation between ninth and twelfth grade GATB aptitudes was fairly high, the GATB profile can be used as a reliable counseling tool as early as the ninth grade with potential vocational students.

5. A broad base of curricular options is desirable for upper level high school students due to the increased diversity of their cognitive and affective characteristics. Options can readily be increased through individualized instruction, modular scheduling, and mini-courses.

6. The effect of time upon the change in selected affective characteristics of students is, for the most part, the same regardless of the curriculum in which the student is enrolled. Therefore, all curricula should be flexible enough to accommodate changing occupational goals.

7. Due to their stated objectives, the various curricula require a degree of commitment to a specific occupation or to a general class of occupations upon initial entry. This commitment may be instrumental in the change in the occupational values of students.

# I

## BACKGROUND AND ORIGIN OF THE PROBLEM

### Introduction

Compulsory public education began in America in 1642 when the leaders of the Massachusetts colony enacted a law requiring all children to learn, "to read and understand the principles of religion and the capital laws of the country," and to be engaged, "in learning and labor . . . profitable to the Commonwealth," in order that they may better serve God and the state (Cubberley, 1947). Shortly after our country won its independence many of our leaders, such as George Washington and Thomas Jefferson, recognized and expressed the need for a good public educational system as a necessary means for enlightening the people and as an essential element for social progress and maintenance of democratic government (Tanner, 1972). The educational system grew very slowly in the early 1800's, but by 1850 various states were providing public elementary education while secondary education remained primarily in the hands of the private tuition academies. The purpose of these academies was to promote a particular religious or social philosophy and to prepare students for entrance into the universities. Support for public secondary education grew in the latter half of the nineteenth century, especially in the southern and western states. This support was due largely to the fact that many of these states had established state

supported universities and wanted to expand their public educational system to include secondary education. The primary purpose of this expansion was to provide those who could not afford the costly academies an opportunity to go on to higher education.

By the beginning of the twentieth century, American society had, for the most part, accepted responsibility for offering public secondary education to all youth who wanted it. Due to social pressures and the fact that compulsory attendance laws required students to stay in school longer, the number of high schools increased rapidly during the early 1900's. The influx of students with varying backgrounds and aspirations forced the high schools to offer diversified programs in order to accommodate all types of students. The classical training programs, which had been the popular approach to education, began to yield to demands for an educational program that was more realistic and attuned to a society which was entering a technological age. With the addition of vocational and general education programs, the comprehensive high school evolved as the instrument essential in achieving the educational goals of society within the realm of secondary education. The comprehensive high school program has changed with the times and continues to serve today's American youth.

Currently our public educational system has many critics, some attacking the system as a whole while others chose to scrutinize one particular aspect. These critics have found many deficiencies in our system and thus have helped the system keep abreast with society through pointing the way to effective change. Educators are being held

responsible for the task that they have been given, namely that of providing the best possible education for our children with the resources available. This is not a new concept in education. Educators have always been [illegible] with the performance of their students in academic, personal, and social areas, and have assumed at least partial responsibility for changes that occur in all three areas. What is new is the fact that the evaluation of many programs in education is now being determined through a cost-effectiveness and cost-benefit approach.

Performance contracts, behavioral objectives and educational audits are emphasized as a mean to achieve the demands for accountability. Use of these types of criteria places emphasis on specific knowledge and skills which are elements of the cognitive domain, and tend to de-emphasize values and attitudes which are important elements of the affective domain and are major determinants of a student's success or failure throughout life as well as in school (Morris, 1972). Taking this into account, plus the fact that it is very difficult, if at all possible, to separate the elements of the cognitive and affective domains in the educational process (Dressel, 1971), accountability must be considered as germaine to elements of the affective domain as it is to those of the cognitive domain.

The affective domain is comprised of elements which emphasize a feeling, an emotion, or a degree of acceptance or rejection. The elements are commonly expressed as interests, appreciations, values, attitudes, and emotional sets. In the affective domain the concern is

that a student does perform a task at the appropriate time after he has learned how to perform the task.

The affective domain can be organized as a continuum of five major behavioral categories each with subcategories of behaviors (Krathwohl, et al., 1964). The major categories range from receiving, which is the lowest level of activity, through responding, valuing, organizing, and characterization, which is the highest level of affective behavior. The lowest level of activity in the affective domain is an awareness of a stimuli. As the learner becomes aware of the stimulus he develops an attitude toward it and can discriminate between it and can discriminate between it and other stimuli. The learner now moves from a receiving to a responding behavior where he becomes willing to respond and can derive satisfaction from his response. At this point the learner begins to value the stimulus. He actively seeks out the stimulus in the early stage of the valuing behavior and evidences the value in his own behavior while at the later commitment stage, he distinctly attempts to convince others of the value of the stimulus. The learner now organizes his value system by relating the values that he has held to the new value and makes the necessary adjustments to derive a stable value system. Characterization is the final and most complex level of affective behavior. The value system becomes internalized to such an extent that the learner is characterized as having a predisposition to behave in a predictable fashion.

The amount of time required for a stimulus to become valued and finally integrated into the character of the learner will vary in each

situation. Factors such as relative valence of the stimuli, conflicting stimuli, existing internal value structure, peer group values, other social pressures, and past experiences are all variables that intervene in the process of establishing a value system. As a person matures, he establishes a value system which generally becomes more rigid and less susceptible to change (Katz, 1963).

By measuring a person's behavior at two points in time, the amount of change that has taken place can be determined, but how much of this change is due to experience (learning) and how much is due to time (maturation) is not easily discovered. Both learning and maturation have an effect upon the change that occurs in a student's behavior during the high school years. The construct of maturity implies that change is taking place in an individual due to time alone. However, during this period of time there are interactions between the individual and his environment which results in learning, and this learning is also responsible for some of the change that occurs. Many of the physical changes that take place in humans are quite obvious, but the congruence between a child's physiological development and the learning that takes place makes it difficult to discover the effects of maturation versus experience. An example to be considered here would be that of a child learning to talk. He talks only after he has assimilated a certain amount of information about his environment, so that he categorizes and analyzes his world in ways that make it possible for him to understand certain aspects of the adult's language. The regions of the brain which are probably important for speech mature later than those which support visual perception. The question of whether he begins to

talk only after becoming familiar with the world of objects and events which the language describes or only after his brain has matured is not easily answered.

As people grow older and learn they mature in many ways. The construct of vocational maturity has been developed to determine the effect that maturation has with regard to a person's vocational decisions. Vocational maturity has been considered of great importance to many investigators concerned with vocational development (Super and Overstreet, 1960; Crites, 1965, 1969). In a theory of occupational choice as proposed in the first monograph of the Career Pattern Study (CPS) (Super, et al., 1957) the process of choosing an occupation is described as developmental and is modified with time. The construct of vocational maturity, which is an integral part of this theory, implies that as a person matures he will be able to make better decisions concerning his career. However, this construct encompasses more than vocational choice. It also includes:

> . . . attitudes toward decision making, comprehension and understanding of job requirements, planning activities and abilities, and development of vocational capabilities (Crites, 1965, p. 4).

These attitudes, with which vocational maturity is concerned, are likely to change during an adolescent's high school experience. This change is undoubtably due to a combination of time and experience.

Any parent, counselor, or teacher could assure us that just as students' attitudes toward the world of work change their values, or the expression of values, also change noticeably during the high school years. Values are reflective of needs and are manifest in

interests of the individual (Katz, 1963). A common example of the change in values of adolescence is the lack of concern for personal grooming of many junior high boys. By the time these boys are seniors, it would be expected that they would be more conscious of their appearance. The occupational values of adolescents also change as they mature (Dipboye and Anderson, 1959; Gribbons and Lohnes, 1965; Kapes and Lotowycz, 1972).

The interaction that the student encounters with peers, teachers, parents and others, gives him much new information which will either reinforce or alter his existing value structure. However, as one progresses through adolescence, he tends to adjust his value system in a predictable direction (Katz, 1963) representing a normal growth or maturation process. The change in occupational values is due in part to the maturation process, but it is also affected by experiences and the learning process. We cannot effectively measure the amount attributable to either effect, but we must be aware that both do in fact, contribute to the change in values that we measure.

As the adolescent matures and learns more about the world in which he lives and his place in that world, he must formulate and often alter his plans for the future. Along with the occupation that he chooses to enter, he must make the necessary preparations which may include post high school education. Often when a high school student changes his career goals, he must alter his educational plans. In a study of high school boys, McDill and Coleman (1965) found that post high school educational plans do change from ninth to twelfth grade. They found that

changes in educational plans were related to several variables, but the most important variable was that of genuine interest.

Since elements of the affective domain cannot be effectively separated from those of the cognitive domain, it can be assumed that maturation and learning will also have an effect upon cognitive elements. The cognitive domain is basically composed of things such as general intelligence, knowledge, and specific aptitudes (Lohnes, 1966). General intelligence is a very broad trait that encompasses quickness and quality of response to all cognitive tasks. This trait is essential to the facilitation of basic knowledges. Knowledge is a performance trait that enables one to generate and apply information in specific areas. There must be opportunities for the acquisition of knowledge as well as innate characteristics. An aptitude is a performance task which facilitates speed and precession of response to items from a specific class of relatively simple tasks. Having an aptitude for a particular set of tasks infers ability to learn and understand elements of that set.

Droege (1966) conducted a longitudinal maturation study with the General Aptitude Test Battery (GATB), a multiple abilities instrument. The two specific aspects of maturation which Droege chose to give major consideration to in his study were suitability of aptitude measurement in the lower high school grades and the average aptitude score increase in high school. Droege found that mean scores for each of the subtests increased for each grade level. This observed change could be attributed primarily to maturation, but we cannot discount the effects of learning without further investigation.

The available literature which was reviewed in Chapter 2 of this paper established relationships between many of the various elements introduced here and the changes that take place within these elements during adolescence and more particularly the high school years. Although more information about the change that occurs in both the affective and cognitive domains is needed, far more is known about the cognitive behavior of high school age youth than about their affective behavior. Since this is so, it is possible to study the change in the affective behavior of students during the high school years more effectively, by using a measured change in cognative behavior as a bench mark for comparison. The change in specific aptitudes as measured by the GATB, will be used for this purpose in this investigation.

## Statement of the Problem

This investigation is concerned with the effects of various curricula in the comprehensive high school on the change that occurs in selected student characteristics from ninth to twelfth grade. This research is part of a continuing longitudinal study conducted by the Department of Vocational Education of The Pennsylvania State University under the title of Vocational Development Study (VDS) project. The student characteristics which were chosen for this study are for the most part elements of the affective domain including occupational values, vocational maturity, and post high school educational plans. However, since the affective and cognitive domains are closely interrelated, some attention must be given to change that occurs within the cognitive domain. Therefore, change in aptitudes will be studied as

measures of change occurring in the cognitive domain. Since the emphasis of this study is on change in elements of the affective domain, the study of change in aptitude will be limited to students enrolled in the vocational curriculum.

There are numerous studies concerning work values and various instruments designed to measure work values (Impellitteri and Kapes, 1971). One such instrument is the Occupational Values Inventory (OVI) developed by Impellitteri and Kapes in conjunction with the VDS project. Through prior investigations, as part of the VDS project, a relationship between the OVI values and the curriculum in which a student was enrolled during the ninth grade has been established (Kapes, 1971). The OVI has also been used to study change in occupational values in relation to curriculum (Kapes and Lotowycz, 1972). Since the validity of this instrument for measuring adolescent work values has been established, the OVI was used as the measure of work values in order to examine the effects of curriculum on changes in work values which occur during high school.

The relationship between vocational maturity and the grade level of high school youth has been established by Crites (1965) using the Vocational Development Inventory (VDI). Super and Overstreet (1960), in their study of the vocational development of ninth grade boys, found that many were not ready to make sound decisions concerning future vocations.

> According to our data, vocational maturity in the ninth grade does not appear to involve having consistent or realistic vocational preferences, having clear-cut interests or work values, or having an independent work experience. It is not, at this stage, characterized by preferences which are consistent with each other

> or with the realities of the self or of the occupational world, or by any initial achievement of a place for oneself in the working world (Super and Overstreet, 1960, p. 149).

This investigation examined change in vocational maturity using the VDI to determine the effects of various curricula upon the vocational development process.

As one matures and learns he will often make adjustments in his value system. The adjustment or change that occurs may have an effect on the post high school educational plans of a high school student through a change that occurs in occupational goals. Each high school curriculum in which a student may be enrolled requires a specific set of exposures which differ from all other curricula and therefore each may have a peculiar effect on change in post high school educational plans. This investigation attempted to determine whether or not change in post high school educational plans from ninth to twelfth grade is related to the curriculum in which the student was enrolled.

When Droege (1966) found that aptitude scores, as measured by the GATB, tended to improve from ninth to twelfth grade, he did not study the possible effect of curriculum on this improvement. This investigation concerned itself with change in aptitudes as measured by the GATB for students enrolled in the vocational curriculum.

In order to provide a framework for the investigation of the relationship between selected characteristics of students and curriculum from ninth to twelfth grade the following questions were posed:

1. Research demonstrates that work values tend to change over time. For each of the seven values of the OVI as measured in ninth grade and again in twelfth grade:

a. Is there a change due to time?

b. Does the amount of change differ among the five curricula?

2. Research has shown that vocational maturity scores increase over time. For vocational maturity as measured by the VDI in ninth grade and again in twelfth grade:

   a. Is there a change due to time?

   b. Does the amount of change differ among the five curricula?

3. The post high school educational plans of high school students have been shown to change from ninth to twelfth grade:

   a. Is there a change in post high school educational plans (college versus non-college) due to time?

   b. Does the amount of change differ among the five curricula?

4. Research has shown that aptitude scores as measured by GATB increase with time. For Vocational students do aptitude scores as measured by the GATB in ninth grade and again in twelfth grade change due to time?

# II

# REVIEW OF RELATED LITERATURE

## Introduction

A review of the literature was conducted in order to identify research which is related to this study. The material reviewed was classified into four major categories:

1. Studies relating to work values and their change over time.
2. Studies related to the differences in vocational maturity among students enrolled in various curricula and the change that occurs in vocational maturity scores over time.
3. Studies related to post high school educational plans of students enrolled in various high school curricula and the changes that occur in those plans throughout the high school years.
4. Studies concerning the use of the General Aptitude Test Battery in longitudinal studies.

The material reviewed in this chapter is by no means complete, but is a short synthesis of literature which is pertinent to this research.

## Studies Related to Change in Work Values Over Time

The following review of studies which are related to the change in work values over time is taken, for the most part, from a similar review reported in VDS monograph number 5 by Kapes and Lotowycz (1972).

Wagman (1968) using Centers' Job Values Questionnaire investigated sex and age differences among university sophomores and high school seniors related to occupational value stability. Wagman administered

Centers' instrument to 122 men and 137 women who were enrolled in an introductory psychology course at the University of Illinois in the spring of 1962. This group was compared to a sample of senior high school students (males = 373, females = 416) used in studies conducted by Singer and Stefflre (1954a, 1954b) who were investigating values relative to sex and age differences. Wagman's findings related to age differences revealed significant differences in value hierarchy among the different groups. Senior high boys scored higher on such job values as security and independence while sophomore men scored higher on the occupational values of leadership, interesting experience and esteem. Related to age differences for females, senior high girls scored higher on the occupational values of security and independence whereas university sophomore women preferred the job value of interesting experience. Wagman's results may not be completely relevant to this study since his research design was cross-sectional rather than longitudinal; however, for the most part, the groups possessed more similarities than differences.

Thompson (1966) examined the change in occupational values between ninth and tenth grades in a group of 1,700 high school students. The instrument used to assess the occupational values was adapted from Centers' (1949) study. When looking at the sample as a whole, little difference was found over the one year time interval. When the data was analyzed by sex, some differences were found in rating occupational values. Males tended to place more value on leadership, salary and recognition and less on self-expression and social service than did females.

Dipboye and Anderson (1959) investigated the ranking of nine occupational values by male and female high school freshmen and senior students. Their sample consisted of 1,131 high school students attending schools in urban, suburban and semirural areas in Central New York. Within the sample, there were 823 pupils (410 boys and 413 girls) in the ninth grade and 358 pupils (171 boys and 187 girls) in the twelfth grade. Their findings related to sex differences for both ninth and twelfth grade boys and girls revealed a great deal of similarity in the pattern of mean ranking of the nine occupational values. Differences did appear, however, when the mean rankings of the individual values for the various groups were compared. Their findings related to sex and grade differences showed an even greater amount of similarity between the responses of the pupils for the two grades than exists between the sexes. They concluded that "the relatively small differences between the ninth and twelfth graders would seem to indicate that occupational values are generally well formed by the time the pupil completes the ninth grade and that little change takes place during his high school career."

Searle (1962) investigated the stability of occupational values in a longitudinal study among a selected population of dropouts, graduates, and students from the Michigan State University. Searle concluded that no one vocational value differentiated between dropouts, graduates, and students. "It seems that the results on the whole tend to reflect either idealized responses or the fact that values are more stable than perceived."

Gribbons and Lohnes (1965, 1968) examined the shifts in adolescents' vocational values over a seven year period. Data was collected through interviewing techniques for 111 boys and girls beginning at the eighth grade. The interview consisted of a series of questions dealing with value configurations resulting in the organization of 12 occupational value categories which seemed to accommodate the responses from the interviews. The interviews were conducted over four points in time (eighth grade, tenth grade, twelfth grade, and two years out of high school). This research effort sought specific answers to two questions: (1) Is there an important shift in the typical hierarchy of vocational values over seven years of adolescence? and (2) Is there an important difference between the typical hierarchy of vocational values for boys and that for girls?

Related to the first question, Gribbons and Lohnes did detect significant shifts in the hierarchy of vocational values over the seven year period. They also stated that there was relatively little change in the value that an adolescent places utmost in his own value hierarchy. By far, the most popular occupational values held by both sexes was interest and satisfaction. The most noticeable trend for the sample, ignoring sex differences, was the development of a less idealistic value hierarchy over the seven year time period. The sample changed their emphasis from such values as social services, personal goals, location and travel; to marriage and family, preparation and ability, and advancement.

Related to the second question, Gribbons and Lohnes found that typical hierarchies of vocational values for the two sexes do reveal an

important contrast. Boys gave higher rankings to salary and prestige values while girls placed more importance on such values as personal contact and social service. Gribbons and Lohnes concluded that overall comparisons of the final hierarchies for the two sexes is dominated by similarities rather than by differences.

Kapes and Lotowycz (1972) studied the change in occupational values of 978 students (488 boys and 490 girls) as related to curriculum and other student characteristics. The value measure used in their study was the Occupational Values Inventory (OVI) which was administered to the sample in the ninth and tenth grades. The Kapes and Lotowycz study utilized the same basic Altoona sample used in this current study and, therefore, their study is reviewed here rather extensively.

The various student characteristics which were studied include: curriculum, sex, interaction between sex and curriculum, family background, General Aptitude Test Battery (GATB) Verbal and Numerical aptitudes, and grade point average. In order to isolate and measure the unique contribution of each of the various independent variables, multiple regression analysis was employed.

The results of this study indicate that the value, Interest and Satisfaction, possessed the highest average correlation with all of the student characteristics in both ninth and tenth grade. Although the ninth grade correlations were higher than the tenth grade correlations, little difference was found. When considered individually, values which were significantly correlated with curriculum, at the .05 level, were: Interest and Satisfaction, Salary, and Personal Goal in the ninth grade, and Interest and Satisfaction, and Personal goal in the tenth grade. When Multiple Regression Analysis was implemented to determine the

unique contribution of each of the student characteristics to a unit increase in each OVI score, the only significant relationship between curriculum and OVI scores was for the value of Personal Goal as measured in the tenth grade. The relationship between ninth grade values and tenth grade values was found to be fairly low, with correlations between .38 and .48. When all student characteristics were considered, the relationship between them and OVI scores were similar for both grades. However, the degree of relationship was inclined to decrease from ninth to tenth grade. When the variable considered was the interaction between sex (male and female) and curriculum (vocational and academic) a significant interaction was found for the values of Security and Prestige in ninth grade, with Security, and Interest and Satisfaction being significant in the tenth grade. Vocational males, who were usually different from the other three groups, had a lower value for Prestige in ninth grade and Interest and Satisfaction in tenth grade and a higher value for Security in the ninth grade.

Zytowski (1970) made a rather complete review of the concept of work values. Relative to the stability of occupational values, Zytowski indicated that to take a firm position would be somewhat unrealistic as a result of inconsistency among related research studies.

Summary

The literature reviewed here and in previous related VDS monographs has uncovered the following findings which are pertinent for this study:

1. Work values have been found to be related to sex, curriculum choice, ability, socioeconomic status, school achievement,

aspirations, age, interests, occupational choice, and personal adjustment.

2. Work values appear to be stable enough in ninth grade to warrant their usefulness in vocational guidance, however, they also appear to fluctuate enough in intensity and direction during the high school years to make further research necessary.
3. In order to validly study the change in occupational values structure during the high school years, a longitudinal research design is essential.

## Studies Related to Vocational Maturity

The construct of vocational maturity was first introduced by Super (1955) to denote the degree of vocational development of an individual through the various life stages. Super identified two stages of vocational maturity:

> Vocational maturity I focuses on life stages and is indicated by the actual life stages of an individual in relation to his expected life stage (based on his chronological age). Vocational maturity II focuses on the developmental tasks and is represented by the behavior of the individual in handling the developmental tasks with which he is coping (Super, et al., 1957, p. 57).

The Vocational Development Inventory (VDI) has been selected as the measure of vocational maturity for this study. This instrument is an attitude scale which is intended to operationally define the affective elements of vocational maturity and, therefore, it deals with the construct of vocational maturity in the realm of Vocational Maturity II. In relation to the VDI, Crites (1961, p. 256) defines vocational maturity as that construct which "refers to the maturity of an

individual's vocational behavior as indicated by the similarity between his behavior and that of the oldest individuals in his vocational life stage." Crites (1965) evidenced the validity and reliability of the VDI, and demonstrated its usefulness in assessing the vocational development of adolescence. Crites found that scores on the VDI were affected very little by sex or socioeconomic status. Curricula differences on VDI scores were investigated in several studies (Crites, 1969). The results were consistent in showing that students who were enrolled in a vocationally oriented program were less vocationally mature than their counterparts. Bathory (1967) studied ninth grade males, 20 of which were vocational students and 62 of which were enrolled in a college preparatory curriculum. The mean scores reported were 30.75 for the vocational students and 34.98 for the college preparatory students; these differences are significant at the .01 level. A similar comparison of seniors was nonsignificant, which may be attributed to the small n's used in the study (15 vocational and 43 college prep students). However, the college prep students had a mean score which was more than 3 points higher than the vocational students. Dutt (1968) conducted a study of the difference in VDI scores between vocational and non-vocational majors. His findings correspond with those of Bathory's in that the vocational students scored significantly lower than the non-vocational students. Similar results were obtained by Halloway (1967) in a study of 119 cooperative vocational education students and an equal number of vocational education students not enrolled in a cooperative program. Each group was equally divided by sex with medians of 35.98 and 38.69 respectively for the cooperative and

non-cooperative vocational students, which were significantly different at the .005 level. Impellitteri, et al. (1969) conducted a study with approximately 1000 ninth grade students in which they investigated several hypotheses concerning vocational maturity as measured by the VDI. The results of this research indicate that the students who plan to attend college have significantly higher scores than those who do not aspire to college. Other factors found to be significantly related to VDI scores were sex and intelligence, with intelligent females scoring higher on the VDI. Although curriculum (vocational versus non-vocational) may have been significantly related to VDI scores had simple relationships been examined, using multiple regression analysis (the statistical methodology used to analyze the data) the relationship was nonsignificant.

Gribbons and Lohnes (1968), using their eight Readiness for Vocational Planning (RVP) scales, which they have interpreted as a measure of vocational maturity, assessed the vocational maturity of students in eighth and again in tenth grade. Their results indicate that although a significant change had occurred during this period of time, the college preparatory students scored consistently higher than the industrial arts-general education students, and business education students.

Through the work of various researchers, variables other than curriculum have been found to correlate with VDI scores (Crites, 1971). Myers (1966) and Asbury (1968) found that disadvantaged youth scored significantly lower ($P<.01$) than the norm. Ethnic and racial influences have been found to have a stiflying effect on vocational maturity as measured by the VDI (Cooter, 1966; McCrystal, 1967; Miller,

1968). Research has consistently shown that vocational maturity is positively related to intelligence (Crites, 1971). Cover (1958), in a study of males who were high school seniors, found a correlation of .45 between the VDI and SCAT. In a group of 215 college male sophomores, who are more homogeneous than high school students, Williams (1967) found a correlation of .20 ($P<.01$) between the VDI and the SAT-Verbal. A correlation of .28 between the VDI scores and the Otis Quick Scoring I.Q. test was obtained by Asbury (1968) on a sample of 68 disadvantaged eighth graders. In a more recent study of inner city eighth grade boys Maynard and Hansen (1970) found a correlation of .47 ($P<.01$) between VDI scores and intelligence. Because of this strong relationship, they controlled the intelligence variable through analysis of covariance, which yielded a nonsignificant difference between the inner city groups and the suburban control group on the VDI.

Although there is more variability on VDI scores between grade levels than within grade levels (Crites, 1971) the mean scores vary markedly from one sample to another within a given grade level. The grand mean scores for all ninth and eleventh grades is 37.36 and 38.63 respectively (Crites, 1971). The variability of group grand mean scores tends to decrease as grade level increases: 5.89 for ninth grade samples and 3.58 for eleventh grade samples. Despite the differences among samples within grade levels, there is usually a significant increase in vocational maturity mean score for each grade level in each sample (Crites, 1971).

Summary

1. Vocational maturity, as measured by the VDI, increases throughout the high school years.
2. Vocational students tend to have lower VDI scores than non-vocational students.
3. Vocational maturity seems to be related to intelligence and educational aspiration.
4. VDI scores for students from low socioeconomic backgrounds or for students from various ethnic or racial minority groups are lower than the overall norms.
5. Variability of VDI scores within a grade level decreases as grade level increases.

## Studies Related to Post High School Educational Plans of High School Students

Many studies equate a student's educational plans with his educational aspirations. A person's aspirations are apt to be more idealistic than his plans. An aspiration is not governed in any way by reality, but a plan (preference) must to some extent depend on reality (Crites, 1969, p. 133). A plan can be defined as a person's perception of what he will be doing or has done at some specified time; whereas an aspiration is defined as a person's desires or wishes. This study is concerned with the educational plans of students; however, since aspirations and plans are the same basic nature and most research reports do not differentiate between aspirations and plans, literature reporting both aspirations and plans have been reviewed here.

The stability of students expressed educational and vocational plans was investigated by Bligh and Shaffer (1972). These plans were obtained from two samples; 738 eighth graders who were surveyed again in the tenth grade, and a group of 633 tenth graders who were surveyed again while they were in the twelfth grade. Through bivariate analysis the stability of plans was ascertained. The students who planned to attend some kind of college, either two-year or four-year, had the most stable educational plans. The educational plans of the younger groups were less stable than those of the older group. When students who planned to attend all types of colleges were combined, between 75% and 80% of all the students who had initially indicated a preference for some kind of college training maintained this interest over the two-year period.

Gribbons and Lohnes (1968) studied student's educational aspirations in the eighth, tenth, and twelfth grades. They found that many more eighth grade students indicated a desire to attend college than were likely to attend, and that the percentage of boys aspiring to attend college was greater than girls, 75% to 41% respectively. From eighth to twelfth grade there was a definite downward trend in the number of students who aspired to college. When the students were grouped according to the curriculum in which they were enrolled, the investigators found that while the proportion of college preparatory students aspiring to college decreased from eighth to twelfth grade, from 56% to 40%, the proportion of business students with college aspirations remained constant.

Drabick (1963) studied three facets of occupational and educational aspirations and plans: (1) expectations relative to future occupational and educational plans; (2) the relationships between certain social and economic factors and occupational and educational plans; and (3) the differences that exist between vocational agriculture senior boys and non-vocational agriculture senior boys. The sample was drawn from 23 high schools in North Carolina. The findings of this research indicated that although the desire to attend college was lower for vocational agriculture students the difference was not significant. The high school experience had no great influence for either group on the decision to attend college. Drabick attributed the lower aspirations of the vocational agriculture students to the lower I.Q. scores of these students, since educational aspirations and I.Q. scores are at least casually related.

In a study of factors associated with the vocational development of high school agricultural education students in 21 public high schools in Illinois, Byler and Hemp (1972) found that the number of years of post high school educational plans was significantly related ($P<.01$) to the student's vocational maturity score as measured by the VDI. The relationship between post high school educational plans and level of occupational aspiration was also significant at the .01 level.

Bowles and Slocum (1967) assessed the educational aspirations and expectations of high school juniors and seniors. They found that only 10.1% of the students expected high school graduation to be their highest educational achievement. Boys and girls of both grade levels

were very similar in their aspirations with 76.3% aspiring to attend college at some point in time and 39.4% expecting to graduate from college.

Flanagan et al. (1964) in a Project Talent report describing various characteristics of American high school students reported that 53% of the boys and 46% of the girls in their sample were planning to attend college immediately after high school graduation. Plans to eventually attend college were held by 73% of the boys and 58% of the girls.

Summary

1. There appears to be a relationship between curriculum and level of post high school educational plans.
2. Boys tend to aspire to a college education more often than girls.
3. The number of high school students who plan to attend college decreases to correspond more with reality during the high school years.
4. Post high school educational plans seem to be related to the student's vocational maturity and occupational aspirations.

## Studies Concerning the Use of the General Aptitude Test Battery (GATB) in Longitudinal Studies

The United States Department of Labor (1967) published General Aptitude Test Battery, Section III: Development which contains a comprehensive look at what has been done with the GATB in the past. Two

of the many articles cited in that manual are particularly pertinent to this research and will be reviewed here.

The results of studies which investigated the stability of GATB scores with high school students were reported by the U.S. Department of Labor (1967). The GATB was administered to 633 students in the ninth and again in the twelfth grade between 1948 and 1951. Aptitudes V, S, and P showed significant change in their relationship with high school success criteria over the test period. Additional stability studies, with data gathered in ninth and twelfth grades, examined the relationship between aptitude scores at two points in time and found correlations that ranged from .69 to .77 on the average.

Droege (1966) conducted a longitudinal maturation study with the GATB to ascertain the stability of aptitude measurement in lower high school grades and to determine the average aptitude score increase in high school which can be attributed to maturation and growth. The final sample of 26,708 was tested once each year in the ninth through the twelfth grades. Droege found that mean scores increased for all nine aptitudes on boys and girls; and that twelfth grade mean scores tended to be higher than 100, which is the mean for the GATB General Working Population Sample. Droege also found that the standard deviations for all aptitudes in both ninth and twelfth were less than 20, which was the standard deviation for the GATB General Working Population Sample. The largest increase for all aptitudes was between the ninth and twelfth grades and the smallest between eleventh and twelfth grades. Droege also found that numerical aptitude (GATB-N)

increased the least and the motor coordination aptitude (GATB-K) increased the most from ninth to twelfth grade. The GATB aptitude scores were reported to be stable enough at ninth grade to be useful.

Kapes (1971) studied the relationship between selected characteristics of ninth grade boys and their success in the tenth grade curriculum in which they were enrolled (i.e. academic or vocational). The academic students scored higher than the vocational students on all of the GATB aptitudes with the smallest difference noted for the spatial and dexterity aptitudes. For the vocational sample, all nine GATB aptitudes were found to be positively related to the success criteria, but only GATB variables V, N, S, P, and Q were positively related to the academic students success criteria. However, of the sixteen independent variables studied in both samples, of which eight were GATB aptitudes, the only aptitudes which were significantly uniquely related to grade point average when multiple regression analysis was used were GATB-V and GATB-N.

Summary

1. GATB aptitude scores tend to increase from ninth to twelfth grade. Much of this increase seems to be related to maturation.
2. Academic students seem to have higher aptitude scores than vocational students; however, the profiles are very similar.
3. Significant relationships between GATB scores and success criteria are similar for vocational and academic students.
4. The variability of GATB aptitude scores is increased slightly

throughout high school, but remained less than that of the GATB General Working Population Sample.

# III

# PROCEDURES

## Population and Sample

The population from which the sample used by this study was drawn was made up of the ninth grade enrollment in the three Altoona, Pennsylvania junior high schools during the 1968-1969 school year. These students are representative of the various ethnic and socio-economic backgrounds which might constitute "an average American city" of 50,000 to 70,000 people.

Altoona, located in central Pennsylvania, was founded in conjunction with the Pennsylvania Railroad in 1849, and grew with the railroad throughout the late 1800's and early 1900's. Since the railroad was the principal employer and was contir ually expanding its facilities at Altoona, there was little unemployment, and other industries were not encouraged to settle in the area. The people that came to work and live in Altoona represent most of the European nationalities: English, Scottish, Irish, Germans, Italians and many others who were willing and able to work in the various railroad shops. During the depression of the 1930's the railroad met with hard times and was forced to layoff many of its employees. The mass layoffs brought to light the necessity for a broad industrial base. New industries began to establish and grow in the Altoona area and continue to do so today through the efforts of various civic organizations. Presently Altoona can boast of a growing diversified industrial base.

The Altoona Area School District serves an estimated student population of 15,000, which, during the 1968-1969 academic year, included the population with which this study is concerned. Numerous elementary schools, three junior high schools, one central senior high school, and one vocational-technical school are utilized to provide instruction in the existing six-three-three school organizational plan.

The data for this study were collected as part of a ten year longitudinal vocational development study conducted by the Department of Vocational Education at the Pennsylvania State University. During the spring of 1969 data were gathered on approximately 1100 students who then made up the ninth grade in the Altoona Area School District. Data sufficient to be included in this study were available for 801 of these students or approximately 73% of the population. Although the data for 801 students were used in this study the number utilized in any one analysis is less than that number due to incomplete data. Since data were gathered at various points in time, a subject may have complete data on one criterion variable, but be missing some data on another variable. When this was the case the subject was included in all analyses where complete data were available for him and was excluded from those analyses where his data were incomplete. In order to remain in the sample a student had to be enrolled at the Altoona Area High School through the spring of 1972 and have both ninth and twelfth grade data on at least one criterion variable. Overall, the sample size for each analysis ranged from a low of 160 students with complete data on the GATB to a high of 720 students with complete data on the VDI.

## Essential Data

### Independent Variable

Curriculum was chosen as an independent variable in this study since it seems reasonable that if a change were to occur in values, vocational maturity, post high school educational plans and/or abilities, the change observed could be related to the differences in the various curricula. It was hypothesized that each curriculum had a substantially different treatment effect over a three year period on the students enrolled. Within the Altoona Area High School a student has a choice of one of five basic curricula. These curricula are: Academic, Business, Home Economics, Secretarial, and Vocational-Technical. The Academic curriculum is designed for the student who plans to go on to college after high school graduation and provides a selection of courses that prepare him for college work. An academic student can specialize in a particular area such as mathematics, science, language, music or art. The Business curriculum is designed for students who are preparing to enter a career in the business world upon high school graduation. Within this curriculum there are two basic sequences, accounting and clerical. The accounting sequence is intended to prepare students who desire to take positions in the field of accounting while the clerical sequence is for students who wish to fill office positions as general clerical workers. The Secretarial curriculum provides vocational training for students who wish to become secretaries or stenographers. The Home Economics curriculum is designed for students who plan to persue one of four career paths upon graduation. These paths

are: to become homemakers; seek employment in occupations based on the skills and knowledge of home economics; combine homemaking and work; or take advanced training in home economics, nursing, merchandising, interior decorating or costume design. The Vocational-Technical program is intended for students who wish to prepare for employment in industrial, trade, or technical occupations. Within the Vocational-Technical areas there were 23 occupational areas in which a student could enroll. This curriculum is not particularly designed for students who wish to continue their education after high school but by scheduling appropriate academic courses a student can prepare for further education.

In the Altoona school system a student is expected to make a decision with regard to curriculum by the end of ninth or early in the tenth grade. This decision may be changed at a later date, but scheduling, loss of credits, and other factors deter students from making such changes. Therefore, curriculum choice is an important decision which has lasting impact and should be made with considerable forethought. Then too, this decision is instrumental in determining future social and occupational direction because of the diversity of preparation provided by the many available curricula. Curriculum choice, therefore, is a significant decision in the career of a student and it is this variable, which is the focal point of this report as it pertains to the time spent in school between ninth and twelfth grades.

The designation of a particular curriculum for each student was made according to the curriculum in which the student was enrolled at mid-term in the tenth grade. By choosing this point to establish

curriculum, early curriculum changes that normally occur were discounted. It was thought that this method would result in a reasonable amount of stability in the curriculum variable.

Dependent Variables

As previously stated, the purpose of this study was to examine the change that occurred in selected student characteristics between ninth and twelfth grades among the various curricula. The characteristics or dependent variables utilized in this investigation were as follows:

(a) Occupational Values--Of the many instruments which have been developed for the measurement of occupational values, the Occupational Values Inventory (OVI) was selected for use in conjunction with this study. Impellitteri and Kapes (1971) described the development of this instrument and reported preliminary validation studies. The unique contribution of this instrument is that it contains actual "valuing tasks" in an ipsative format phrased in a language easily understood by ninth graders. The following occupational values are assessed by the OVI.

1. Interest and Satisfaction--One likes the work, enjoys it, is happy at it, fulfills oneself by doing it.

2. Advancement--One perceives the opportunity to get ahead in the work, sees a good future in it, it provides an opportunity to improve oneself.

3. Salary--One perceives the financial return resulting from the work, can make a good living at it, sees it as an opportunity for a good income.

4. Prestige--One is impressed by the responsibility attached to the work, can earn recognition from it, desires the feeling of importance that goes with it.

5. Personal Goal--One sees the work as fitting into his way of life, is what one always wanted to do, has been shooting for it, it's the ideal.

6. Preparation and Ability--One can succeed in the work, is good at it, it's where one's talents lie, is suited for it.

7. Security--One can obtain employment in this work, perceives that workers are needed in it, there will always be openings in it (p. 13).

The OVI scores used in this study were composed of the seven OVI values and were obtained from the subjects in the spring of 1969 when they were ninth graders and again in the spring of 1972 when they were seniors in the Altoona school system.

(b) Vocational Maturity--In the early stages of the Career Pattern Study (CPS) conducted by Super, the construct of vocational maturity evolved and has now become a major component of the developmental theories of occupational choice. Super (1957) stated that "the concept of vocational development leads logically to that of vocational maturity" (p. 185).

The Vocational Development Inventory (VDI) attitude scale, developed by Crites (1965, 1969, 1971) is the instrument which was chosen to assess the vocational maturity of the subjects involved in this study. The VDI, which consists of 50 items, is easily administered and scored. This instrument has been successfully administered and validated on samples of various grade levels and especially on the grades of interest in this

study. Crites (1971, p. 72) reported that the VDI does yield mean scores which increase from the lower grades to the higher grades and that it has a sufficient ceiling to be applicable to educational levels as advanced as the senior year of college.

(c) Post High School Educational Plans--In order to examine the effect of the high school curriculum on a student's plans to continue his education, post high school plans were assessed in the following manner:

1. During the spring of 1969 while enrolled in the ninth grade in the Altoona school system, students responded to the question "Do you think you will go to college?" Three different responses to this question were recorded: yes, no, and undecided. Of these, only the first two, yes and no, were of interest to this study and were coded in the following manner: yes = 2, no = 1.

2. During the spring of 1972 the same students, now the senior class of the Altoona Area High School, responded to a questionnaire administered by the VDS project staff. The following question was included in that questionnaire: "Of the following activities check all of those which you expect to be doing in your first year after high school."

    1. Get a full-time job.
    2. Get a part-time job.
    3. Attend a non-degree granting school of some sort.
    4. Attend a two-year college.

5. Attend a four-year college.
6. Join the armed services.
7. Join the Peace Corps or Vista.
8. Explore means other than work for financing further education.
9. Get married.
10. Get your own residence.
11. Maintain a residence with your parents.
12. Travel extensively.
13. Do a lot more dating and meeting of people.
14. Register to vote.

From a student's responses to the first seven options he was classified in one of two categories: college or non-college. The college group was made up of those who indicated that they would be attending a two-year or four-year college as well as those who indicated they would be attending a non-degree granting institution whose program was two years or longer such as registered nurses training. This method of classification was utilized to dichotomize the twelfth grade responses in such a way that they would correspond with the "yes" - "no" answers to the ninth grade question. The non-college classification was coded with a 1 and the college classification was coded as 2.

This variable was considered to be a continuous variable with only two measures, 1 and 2. The lower half of the continuum of "the maximum amount of education," was represented by 1, included in this group were those whose plans did not include attending college. The upper half of the continuum, those who plan more than a high school education, was coded 2.

(d) Aptitudes--Elements of the cognitive domain are more easily measured than elements of the affective domain and therefore

much more has been done and more is known about cognitive elements, such as aptitudes. The change that occurs between the ninth and the twelfth grades in the aptitudes of students enrolled in one particular curriculum (Vocational) was therefore used as a comparative standard for the change that occurred during the same period of time for affective criterion variables. On the basis of previous studies (Dvorak, 1956; Super and Crites, 1962) the General Aptitude Test Battery (GATB) was selected for use in this study because it appeared to be the most complete, validated multible ability instrument commercially available. In a review of the GATB Super and Crites (1962) stated:

> In two revisions of the General Aptitude Test Battery manuals and in a large number of journal articles, Dvorak and her collaborates have . . . provided the empirical evidence needed for the evaluation and use of the test battery: in their current form they are a model of completeness and of clarity (p. 330).

The GATB was developed by the United States Employment Service (USES) for use in employment counseling with adults and has now been extended for use at the high school level. The battery takes approximately two and one quarter hours to administer and is composed of 12 subtests which yield the following aptitude scores:

G - Intelligence--General learning ability. The ability to "catch on" or understand instructions and underlying principles; the ability to reason and make judgments. Closely related to doing well in school.

V - Verbal Aptitude--The ability to understand meaning of words and to use them effectively. The ability to

comprehend language, to understand relationships between words and to understand meanings of whole sentences and paragraphs.

N - Numerical Aptitude--Ability to perform arithmetic operations quickly and accurately.

S - Spatial Aptitude--Ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects. The ability to recognize the relationships resulting from the movement of objects in space.

P - Form Perception--Ability to perceive pertinent detail in objects or in pictorial or graphic material. Ability to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.

Q - Clerical Perception--Ability to perceive pertinent detail in verbal and tabular material. Ability to observe differences in copy, to proof read words and numbers, and to avoid perceptual errors in arithmetic computation.

K - Motor Coordination--Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and swiftly.

F - Finger Dexterity--Ability to move the fingers, and manipulate small objects with the fingers, rapidly or accurately.

M - Manual Dexterity--Ability to move the hands easily and skillfully. Ability to work with the hands in placing and turning motions (U.S. Department of Labor, 1970, p. 1).

## Analysis

In order to provide understandable, meaningful answers to the questions posed in this study two statistical techniques were employed: (1) 2-way Analysis of Variance for Repeated Measures (ANOVRM) and (2) dependent or correlated t test. The dependent formula for these tests was necessary to answer the questions due to the fact that the questions

dealt with the change which occurred in the criterion variables from ninth to twelfth grade, and therefore, the amount of change which occurred could be determined only through the use of two measures on the same subjects.

The 2-way Analysis of Variance for Repeated Measures was utilized to answer Questions #1, #2, and #3, where the changes occurring in the five curricula were compared. The between subjects source of variance was not of interest in this study since this term in effect compared the differences between the combination of the ninth and twelfth grade measures for each curriculum. The remaining sources of variance, within subjects, and interaction were of interest and were reported in Chapter 4 of this study. The within subjects source of variance determined the amount of change which occurred due to the effects of time by combining the five curricula into one group. The interaction source of variance took into account the amount and the direction of independent change which occurred in each of the five curricula. The interaction source of variance therefore was necessary to determine the differential change which occurred over time due to different curricula.

The two basic assumptions which must be met in order to control the possibility of making an invalid decision when utilizing the analysis of variance for repeated measures are: (1) homogeneity of variance of all groups, and (2) homogeneity of correlation between each of the possible pairs of groups. The Box test for homogeneity of the variance-covariance matrix was employed to test these two assumptions and should yield a nonsignificant Chi-square value to justify the use of the pooled error term. Winter (1962, p. 370) explains the relationship between the

Box test and the better known Bartlett's test for homogeneity of variance when he states "This test (Box test) procedure is a multivariate analogue of the Bartlett's test for homogeneity of variance."

The Simple Effects and descriptive data were reported for all of the questions. This was done for several reasons, one of which was to provide those who were interested in changes which occurred in one particular curriculum the opportunity to examine that change independent of the other curricula. The descriptive data which was generated in order to perform the analysis for this study may be useful to those who wish to undertake analyses not conducted in this study. Finally, when the basic assumptions of the ANOVRM are not met interpretation of the results of that test are doubtful and therefore, conclusions should be drawn from the dependent t-test which are reported as Simple Effects Analysis. Also reported are the correlations by curriculum, between ninth and twelfth grade scores, which are essential to the computation of the dependent t-test and provides evidence of change on an individual rather than a group basis.

Since Question #4 was concerned with the students enrolled in the Vocational curriculum only, the dependent t-test was employed to answer this question. This is the same test which was applied in relation to the simple effects for Questions #1, #2, and #3. The dependent t-test is actually a special case of the analysis of variance for repeated measures which is applicable in the two group case.

A probability of .05 was the level of significance at which decisions to retain or reject the tested null hypothesis were made in all cases throughout this study although other probability levels are also reported.

# IV

# FINDINGS

## Introduction

The results of this study are reported in this chapter. The data are presented as it pertains to each question. Data will be reported in tabular form wherever possible, however, some discussion will be necessary so that possible misinterpretations can be avoided.

Tables for the first three questions present the Analysis of Variance for Repeated Measures (ANOVRM), Analysis of Simple Effects due to time presented by individual curriculum, and the descriptive data which is necessary to carry out the statistical analysis. Also reported with the tables is the Box test for homogeneity of the variance and covariance matrices. This test should be non-significant to justify the use of the pooled error term on within subjects tests which include both of the tests reported in the analysis of variance section of the tables.

## Question #1

Research demonstrates that work values tend to change over time. For each of the seven values of the OVI as measured in the ninth grade and again in twelfth grade:

a. Is there a change due to time?

b. Does the amount of change differ among the five curricula?

ANOVRM was utilized to answer both part a and b of Question #1 for each of the seven occupational values of the Occupational Values Inventory. The results of this test, descriptive data and simple effects are reported on Tables 1 through 7, with each table containing all the data which is applicable to a particular OVI value. The descriptive data and simple effects are reported by curriculum, and are reported on each table regardless of the outcome of the analysis of variance in order to accomodate readers who may be interested in one or more particular curricula.

Value #1 - Interest and Satisfaction

Upon reviewing Table 1, which contains data relevant to the value, Interest and Satisfaction, it can be seen through the Box test that the basic assumptions of the dependent analysis of variance have not been violated and therefore it is appropriate to proceed with an interpretation of the main effects. There was a significant change ($P<.05$) from ninth to twelfth grade in the average value score for Interest and Satisfaction among the students in this sample. The average value score for Interest and Satisfaction increased from 19.60 to 20.07 during this span of time. While the change due to time was significant the amount of change due to the interaction between time and curriculum was not significant at the .05 level. Therefore it was concluded that there

TABLE 1. ANOV and Analysis of Simple Effects for 9th to 12th Grade Changes by Curriculum for the dependent variable OVI Value #1, Interest and Satisfaction.

ANALYSIS OF VARIANCE FOR REPEATED MEASURES[a]

| Source of Variance | Sum of Squares | Mean Squares | df | F-Ratio | Prob. |
|---|---|---|---|---|---|
| 9th - 12th Grade | 71.51 | 71.51 | 1 | 4.542 | 0.033 |
| Interaction | 143.82 | 35.96 | 4 | 2.284 | 0.059 |
| Error | 10296.17 | 15.74 | 654 | | |

DESCRIPTIVE DATA AND SIMPLE EFFECTS BY CURRICULUM

| | Curriculum | | | | | |
|---|---|---|---|---|---|---|
| Data Type | Voc. (n=188) | Aca. (n=291) | Sec. (n=72) | Bus. (n=62) | H.E. (n=43) | Total (n=659) |
| 9th Grade | | | | | | |
| Mean | 18.28 | 19.91 | 20.06 | 19.83 | 20.32 | 19.60 |
| S.D. | 4.95 | 5.44 | 4.63 | 4.47 | 3.94 | 5.05 |
| 12th Grade | | | | | | |
| Mean | 18.65 | 20.81 | 20.71 | 18.51 | 20.86 | 20.07 |
| S.D. | 4.83 | 4.86 | 4.60 | 4.52 | 4.96 | 4.81 |
| Simple Effects | | | | | | |
| Correlation | 0.42 | 0.34 | 0.26 | 0.29 | 0.35 | |
| t-ratio | -0.92 | -2.60 | -0.98 | 2.05 | -0.68 | |
| Probability | 0.361 | 0.010 | 0.328 | 0.045 | 0.499 | |

[a]The Box test for homogeneity of the covariance matrix of independent groups indicates homogeneity of variance and correlation at the .05 level.

was a change due to time, and that the amount of change did not differ among the five curricula.

Even though it was concluded that there was no significant difference in the amount of change among the five curricula, for those who may be interested in a particular curriculum, it was decided to examine the change for each curriculum separately. In this particular case, since the interaction between time and curriculum is 0.059 (which is barely above the .05 level of significance), there is good reason to investigate the amount of change due to time within any particular curriculum. An increase, over time, in the average value for Interest and Satisfaction is demonstrated for each curriculum with the exception of the Business curriculum which recorded a decrease. Students in the Business curriculum experienced the greatest amount of change in the value of Interest and Satisfaction with a decrease from 19.83 to 18.51 which was significant at the .05 level. The only other significant change ($P<.05$) which was found within a curriculum, was in the Academic curriculum where the average value for Interest and Satisfaction increased from 19.91 in the ninth grade to 20.81 in the twelfth grade. From this analysis it appears that the overall gain in the Interest and Satisfaction value score was largely due to the Academic curriculum. The correlations between 9th and 12th grade value scores for each of the five curricula tended to be low with the highest correlation 0.42, recorded for the Vocational curriculum.

Value #2 - Advancement

Table 2 contains the information which was related to that portion of Question #1 dealing with the occupational value Advancement. The Box test for homogeneity of the variance-covariance matrix indicates that the assumptions of homogeneity of variance and correlation may have been violated for this analysis. Therefore, interpretation of the ANOVRM is questionable and must be viewed with caution. It was found that the ANOV indicated an insignificant change due to time and that the amount of change due to interaction between time and curriculum is barely significant at the .05 level. Within the reservations concerning the validity of the results of the ANOVRM; it was concluded that there is no significant change over all curricula during the high school years in the occupational value, Advancement, but that the amount of change does differ among the five curricula. The reader is cautioned that these results are based on an analysis in which basic assumptions may have been violated.

Since the basic assumptions of analysis of variance have not been substantiated by the Box test, and because interaction was detected the changes that occurred in students' value for Advancement between ninth and twelfth grade within the individual curricula need to be examined closely. The direction of change over time was not constant. An increase in the average value for Advancement occurred in the Secretarial, Business, and Home Economics curricula; no change occurred for the Vocational curriculum, and the Academic curriculum exhibited a decreased value for Advancement. However, none of these changes in the average

TABLE 2. ANOV and Analysis of Simple Effects for 9th to 12th Grade Changes by Curriculum for the dependent variable OVI Value #2, Advancement.

ANALYSIS OF VARIANCE FOR REPEATED MEASURES[a]

| Source of Variance | Sum of Squares | Mean Squares | df | F-Ratio | Prob. |
|---|---|---|---|---|---|
| 9th - 12th Grade | 12.04 | 12.04 | 1 | 0.621 | 0.431 |
| Interaction | 192.94 | 48.24 | 4 | 2.488 | 0.042 |
| Error | 12678.01 | 19.38 | 654 | | |

DESCRIPTIVE DATA AND SIMPLE EFFECTS BY CURRICULUM

| | Curriculum | | | | | |
|---|---|---|---|---|---|---|
| Data Type | Voc. (n=188) | Aca. (n=291) | Sec. (n=72) | Bus. (n=69) | H.E. (n=43) | Total (n=659) |
| 9th Grade | | | | | | |
| Mean | 14.40 | 12.86 | 13.26 | 13.49 | 11.40 | 13.39 |
| S.D. | 5.56 | 5.54 | 4.44 | 4.94 | 4.80 | 5.35 |
| 12th Grade | | | | | | |
| Mean | 14.40 | 12.19 | 13.29 | 14.35 | 13.09 | 13.20 |
| S.D. | 5.23 | 6.13 | 6.37 | 5.05 | 7.32 | 5.92 |
| Simple Effects | | | | | | |
| Correlation | 0.42 | 0.36 | 0.43 | 0.22 | 0.52 | |
| t-ratio | 0.01 | 1.67 | -0.04 | -1.14 | -1.76 | |
| Probability | 1.000 | 0.097 | 0.969 | 0.258 | 0.085 | |

[a]The Box test for homogeneity of the covariance matrix of independent groups indicates hetrogeneity of variance and correlation at the .05 level.

value for Advancement was significant. The largest amount of change in mean score and standard deviation was observed for the Home Economics curriculum, both the mean score and the standard deviation increased from ninth to twelfth grade. The Home Economics curriculum also yielded the highest correlation coefficient (0.52) between ninth grade and twelfth grade scores for the value Advancement. This indicates that students within this curriculum who had high scores for the value Advancement in ninth grade tended to also have high scores in the twelfth grade. Likewise, those who had low scores for the value Advancement in the ninth grade tended to have low scores in the twelfth grade. Of the five curriculua, the Vocational curriculum had the highest mean value for Advancement in both ninth and twelfth grades while the Home Economics curriculum had the lowest mean score in ninth grade and the Academic curriculum demonstrated the lowest mean score in the twelfth grade.

Value #3 - Salary

Table 3 contains the results of the dependent analysis of variance, descriptive data and the simple effects for ninth to twelfth grade changes by curriculum for the OVI value, Salary. The results of the Box test are nonsignificant; therefore, it was determined that the assumptions of homogeneous variances and correlations were valid and the main effects were interpreted. It was determined that the change observed in the value of Salary between ninth and twelfth grades was not due to chance alone but was due to time, since the F-ratio was significant at the .001 level. The average value for Salary, across all curricula

TABLE 3. ANOV and Analysis of Simple Effects for 9th to 12th Grade Changes by Curriculum for the dependent variable OVI Value #3, Salary.

ANALYSIS OF VARIANCE FOR REPEATED MEASURES[a]

| Source of Variance | Sum of Squares | Mean Squares | df | F-Ratio | Prob. |
|---|---|---|---|---|---|
| 9th - 12th Grade | 2557.58 | 2557.58 | 1 | 72.349 | 0.001 |
| Interaction | 88.21 | 22.05 | 4 | 0.624 | 0.646 |
| Error | 23119.21 | 35.35 | 654 | | |

DESCRIPTIVE DATA AND SIMPLE EFFECTS BY CURRICULUM

| | Curriculum | | | | | |
|---|---|---|---|---|---|---|
| Data Type | Voc. (n=188) | Aca. (n=291) | Sec. (n=72) | Bus. (n=69) | H.E. (n=43) | Total (n=659) |
| 9th Grade | | | | | | |
| Mean | 14.71 | 11.36 | 11.11 | 12.80 | 11.63 | 12.52 |
| S.D. | 6.56 | 7.55 | 6.45 | 6.33 | 6.30 | 6.98 |
| 12th Grade | | | | | | |
| Mean | 17.23 | 14.76 | 13.86 | 15.49 | 12.84 | 15.31 |
| S.D. | 7.12 | 7.80 | 8.36 | 7.15 | 8.27 | 7.66 |
| Simple Effects | | | | | | |
| Correlation | 0.35 | 0.36 | 0.33 | 0.23 | 0.42 | |
| t-ratio | -4.42 | -6.52 | -2.68 | -2.66 | -0.99 | |
| Probability | 0.001 | 0.001 | 0.009 | 0.010 | 0.328 | |

[a]The Box test for homogeneity of the covariance matrix of independent groups indicates homogeneity of variance and correlation at the .05 level.

combined increased from 12.52 in the ninth grade to 15.31 in the twelfth grade, an increase of 2.79 points. It was also concluded that the changes did not differ among the five curricula because of the relatively high probability (0.646) of obtaining by chance an F-ratio of 0.624 with four degrees of freedom.

Again, as for Value 1, an analysis of simple effects is presented for those readers interested in looking at a particular curriculum. When the simple effects were examined it was found that all curricula with the exception of the Home Economics curriculum showed a significant increase ($P<.05$) in terms of the average score change for the Salary value from ninth to twelfth grade. The average value for Salary is much higher for the students in the Vocational curriculum than it is for students enrolled in any other curriculum in both ninth and tenth grade. Students enrolled in the Academic curriculum, on the average, increased their value for Salary more than any other group of students. The correlations between ninth and twelfth grade Salary value scores ranged from .23 to .42 with Home Economics yielding the highest correlations.

Value #4 - Prestige

The data which is relevant to the OVI value, Prestige, is found in Table 4. The Box test for homogeneity of the variance-covariance matrix yielded a significant Chi-square value and therefore the assumption of homogeneous variance and correlation was not supported. Thus, the interpretation of the ANOVRM is questionable and should be interpreted with caution. The results of this test indicate that the observed change in students' value for Prestige due to time was significant

TABLE 4. ANOV and Analysis of Simple Effects for 9th to 12th Grade Changes by Curriculum for the dependent variable OVI Value #4, Prestige.

ANALYSIS OF VARIANCE FOR REPEATED MEASURES[a]

| Source of Variance | Sum of Squares | Mean Squares | df | F-Ratio | Prob. |
|---|---|---|---|---|---|
| 9th - 12th Grade | 1368.47 | 1368.47 | 1 | 68.224 | 0.001 |
| Interaction | 142.74 | 35.69 | 4 | 1.779 | 0.131 |
| Error | 13118.28 | 20.05 | 654 | | |

DESCRIPTIVE DATA AND SIMPLE EFFECTS BY CURRICULUM

| | Curriculum | | | | | |
|---|---|---|---|---|---|---|
| Data Type | Voc. (n=188) | Aca. (n=291) | Sec. (n=72) | Bus. (n=69) | H.E. (n=43) | Total (n=659) |
| 9th Grade | | | | | | |
| Mean | 10.45 | 12.13 | 12.85 | 11.23 | 10.93 | 11.63 |
| S.D. | 5.11 | 5.73 | 4.32 | 4.10 | 4.30 | 5.19 |
| 12th Grade | | | | | | |
| Mean | 8.96 | 9.84 | 9.64 | 9.58 | 9.72 | 9.59 |
| S.D. | 5.39 | 5.88 | 5.75 | 5.21 | 4.60 | 5.60 |
| Simple Effects | | | | | | |
| Correlation | 0.36 | 0.32 | 0.22 | 0.30 | 0.33 | |
| t-ratio | 3.41 | 5.72 | 4.26 | 2.47 | 1.54 | |
| Probability | 0.001 | 0.001 | 0.001 | 0.016 | 0.131 | |

[a]The Box test for homogeneity of the covariance matrix of independent groups indicates heterogeneity of variance and correlation at the .05 level.

($P<.05$). By comparing the ninth grade grand mean of 11.63, to the twelfth grade grand mean of 9.59 it can be seen that there was a decrease in the occupational value, Prestige, during the high school years. When interaction between time and curriculum was examined the change in the value for prestige did not differ among the five curricula. Again, the reader is cautioned about the weakness of this interpretation due to the possible violations of necessary assumptions. Although familywise error is not controlled through the individual t-tests, analysis of the simple effects are the most valid tests available when assumptions for analysis of variance are not met. Therefore, simple effects should be interpreted to determine the amount of change due to time for individual curricula.

When measured in ninth and again in twelfth grade the observed value for Prestige decreased in all curricula, with the Home Economics curriculum the only curriculum that did not yield a significant change at the .05 level. This change due to time was great enough to be significant at the .001 level for the Vocational, Academic, and Secretarial curricula. Vocational students recorded the lowest average value for Prestige in both grades. On the average Secretarial students scored highest on the Prestige value in ninth grade and the Academic students scored highest in the twelfth grade. Standard deviations increased from ninth to twelfth grade for all curricula, and correlations tended to be low and approximately equal (r ranged from .22 to .36).

Value #5 - Personal Goal

Upon reviewing table 5 which contains the data related to value 5, Personal Goal, it was determined by the Box test for homogeneity of the variance-covariance matrix that the necessary assumptions had not been violated; therefore, interpretations of the main effects are valid. The ANOVRM indicated that neither the F-ratio for ninth to twelfth grade nor the F-ratio for interaction was significant at the .05 level. The probability of obtaining an F-ratio as small as 0.003 with one degree of freedom, such as the one obtained from the ninth to twelfth grade source of variance, is 0.957. Likewise, the chance of obtaining an F-ratio of 0.658 with four degrees of freedom is 0.621. The observed grand mean, increased only 0.01 from ninth grade to twelfth grade. From these figures it was concluded that the differences which were obtained were probably due to chance alone. Additionally it was concluded that the amount of change did not differ among the five curricula.

For the reader with an interest in one or more particular curricula the simple effects and descriptive data are presented. The simple effects (t-tests) indicate that students, on the average, did not significantly change their value for Personal Goal from ninth to twelfth grade regardless of the curriculum in which they were enrolled. Vocational students had the lowest average value for Personal Goal in both grades while the highest average value for Personal Goal was found among the Home Economics students in the ninth grade and among the Academic students in the twelfth grade. Both the main effects and simple effects

TABLE 5. ANOV and Analysis of Simple Effects for 9th to 12th Grade Changes by Curriculum for the dependent variable OVI Value #5, Personal Goal.

ANALYSIS OF VARIANCE FOR REPEATED MEASURES[a]

| Source of Variance | Sum of Squares | Mean Squares | df | F-Ratio | Prob. |
|---|---|---|---|---|---|
| 9th - 12th Grade | .0486 | .0486 | 1 | 0.003 | 0.957 |
| Interaction | 43.59 | 10.90 | 4 | 0.658 | 0.621 |
| Error | 10827.37 | 16.56 | 654 | | |

DESCRIPTIVE DATA AND SIMPLE EFFECTS BY CURRICULUM

| | Curriculum | | | | | |
|---|---|---|---|---|---|---|
| Data Type | Voc. (n=188) | Aca. (n=291) | Sec. (n=72) | Bus. (n=69) | H.E. (n=43) | Total (n=659) |
| 9th Grade | | | | | | |
| Mean | 16.98 | 18.91 | 18.60 | 18.61 | 19.79 | 18.41 |
| S.D. | 4.27 | 5.21 | 4.57 | 4.50 | 4.30 | 4.77 |
| 12th Grade | | | | | | |
| Mean | 16.84 | 19.39 | 19.13 | 17.43 | 19.23 | 18.40 |
| S.D. | 4.70 | 5.17 | 5.06 | 4.67 | 5.58 | 5.02 |
| Simple Effects | | | | | | |
| Correlation | 0.32 | 0.21 | 0.26 | 0.40 | 0.42 | |
| t-ratio | 0.36 | -1.22 | -0.86 | 1.20 | 0.68 | |
| Probability | 0.717 | 0.224 | 0.392 | 0.235 | 0.502 | |

[a]The Box test for homogeneity of the covariance matrix of independent groups indicates homogeneity of variance and correlation at the .05 level.

indicated that this value was very stable throughout the high school years and was neither effected by time nor curriculum. The correlations between ninth and twelfth grade for this value ranged from .21 to .42.

Value #6 - Preparation and Ability

Table 6 contains the results of the dependent analysis of variance, descriptive data, and the simple effects for ninth to twelfth grade changes by curriculum for the OVI value, Preparation and Ability. The Box test, which tests the necessary assumptions for interpretation of the results of the ANOVRM, yielded an insignificant Chi-square. This information indicated that homogeneous variance and correlations were found and, therefore, interpretation of the main effects was accepted without reservation. The change due to time, ninth to twelfth grade, yielded an F-ratio of 16.934 with one degree of freedom which is significant at the .001 level and the interaction term yielded an F-ratio of 40.74 with 4 degrees of freedom which is not significant at the .05 level. The average value for Preparation and Ability across the five curricula increased from 17.33 in the ninth grade to 18.31 in the twelfth grade. This data indicates that the value for Preparation and Ability did change, due to time, from the ninth to twelfth grade, and that the amount of change did not differ among the five curricula.

When descriptive data and simple effects were examined it was found that the Academic, Secretarial, and Business curricula yielded a significant change ($P<.05$) in the value of Preparation and Ability from ninth to twelfth grade. Students in four of the five curricula increased their value for Preparation and Ability with the Secretarial students

TABLE 6. ANOV and Analysis of Simple EFfects for 9th to 12th Grade Changes by Curriculum for the dependent variable OVI Value #6, Preparation and Ability.

ANALYSIS OF VARIANCE FOR REPEATED MEASURES[a]

| Source of Variance | Sum of Squares | Mean Squares | df | F-Ratio | Prob. |
|---|---|---|---|---|---|
| 9th - 12th Grade | 315.65 | 315.65 | 1 | 16.934 | 0.001 |
| Interaction | 162.94 | 40.74 | 4 | 2.186 | 0.069 |
| Error | 12186.91 | 18.63 | 654 | | |

DESCRIPTIVE DATA AND SIMPLE EFFECTS BY CURRICULUM

| | Curriculum | | | | | |
|---|---|---|---|---|---|---|
| Data Type | Voc. (n=188) | Aca. (n=291) | Sec. (n=72) | Bus. (n=69) | H.E. (n=43) | Total (n=659) |
| 9th Grade | | | | | | |
| Mean | 17.64 | 16.73 | 16.89 | 17.72 | 18.65 | 17.33 |
| S.D. | 4.34 | 5.12 | 4.76 | 4.48 | 4.21 | 4.76 |
| 12th Grade | | | | | | |
| Mean | 18.02 | 17.77 | 19.03 | 19.54 | 18.46 | 18.31 |
| S.D. | 5.08 | 5.15 | 4.94 | 4.48 | 4.04 | 4.99 |
| Simple Effects | | | | | | |
| Correlation | 0.15 | 0.22 | 0.40 | 0.14 | 0.21 | |
| t-ratio | -0.84 | -2.78 | -3.40 | -2.57 | 0.24 | |
| Probability | 0.402 | 0.006 | 0.001 | 0.012 | 0.815 | |

[a]The Box test for homogeneity of the covariance matrix of independent groups indicates homogeneity of variance and correlation at the .05 level.

reporting the largest increase; 16.89 in the ninth grade to 19.03 in the twelfth grade. The only curriculum to report a decrease in the value of Preparation and Ability was the Home economics curriculum. These students had the highest average score for this occupational value in the ninth grade (18.65), but the Business students had the highest average value for Preparation and Ability in the twelfth grade. The Academic students recorded the lowest average value for Preparation and Ability in both ninth and twelfth grades. Except for the Secretarial curriculum which produced a ninth to twelfth grade correlation of .40, all other correlations were low.

Value #7 - Security

Table 7 contains the results of the dependent analysis of variance, descriptive data and the simple effects for ninth to twelfth grade changes by curriculum for the OVI value, Security. The Box test of the variance-covariance matrix yielded an insignificant (P>.05) Chi-square, thus the basic assumptions were retained and the resulting F-ratios and probabilities are valid. On this premice it was determined that when measured in the ninth and again in the twelfth grade there was a change in students' value for security which was due to the effect of time. However this change did not differ significantly among the five curricula. For the ninth to twelfth grade source of variance the reported F-ratio, with one degree of freedom, has a probability of 0.001 which indicates that the observed change was probably due to the effect of time and not due to chance. Conversely the F-ratio obtained for the interaction source of variance, with four degrees of freedom, had a

TABLE 7. ANOV and Analysis of Simple Effects for 9th to 12th Grade Changes by Curriculum for the dependent variable OVI Value #7, Security.

ANALYSIS OF VARIANCE FOR REPEATED MEASURES[a]

| Source of Variance | Sum of Squares | Mean Squares | df | F-Ratio | Prob. |
|---|---|---|---|---|---|
| 9th - 12th Grade | 999.93 | 999.93 | 1 | 49.528 | 0.001 |
| Interaction | 60.42 | 15.10 | 4 | 0.748 | 0.559 |
| Error | 13203.66 | 20.19 | 654 | | |

DESCRIPTIVE DATA AND SIMPLE EFFECTS BY CURRICULUM

| | Curriculum | | | | | |
|---|---|---|---|---|---|---|
| Data Type | Voc. (n=188) | Aca. (n=291) | Sec. (n=72) | Bus. (n=69) | H.E. (n=43) | Total (n=659) |
| 9th Grade | | | | | | |
| Mean | 12.51 | 11.67 | 12.24 | 11.77 | 12.28 | 12.09 |
| S.D. | 5.79 | 5.80 | 6.19 | 4.58 | 5.41 | 5.71 |
| 12th Grade | | | | | | |
| Mean | 10.88 | 10.24 | 9.28 | 10.10 | 10.79 | 10.35 |
| S.D. | 4.78 | 5.16 | 5.17 | 5.12 | 5.16 | 5.06 |
| Simple Effects | | | | | | |
| Correlation | 0.29 | 0.25 | 0.36 | 0.32 | 0.50 | |
| t-ratio | 3.52 | 3.62 | 3.87 | 2.43 | 1.84 | |
| Probability | 0.001 | 0.001 | 0.001 | 0.018 | 0.073 | |

[a]The Box test for homogeneity of the covariance matrix of independent groups indicates homogeneity of variance and correlation at the .05 level.

probability of 0.559 indicating that the different amounts of change among the five curricula was more than likely a result of chance. The average value for Security, as measured by the OVI decreased from 1[illegible].09 in the ninth grade to 10.35 in the twelfth grade.

The simple effects are discussed here, along with the descriptive data, for readers with interests in a particular curriculum or particular curricula. Four of the five curricula demonstrated a significant ($P<.05$) decrease in the average value for Security from ninth to twelfth grade. The Home Economics curriculum was the only curriculum which did not demonstrate a decrease in the value of Security ($P<.05$). The Vocational students demonstrated the highest average value for Security in both ninth and twelfth grades. The lowest average value for Security was attributed to the Academic students in the ninth grade and to the Secretarial students in the twelfth grade. The correlations between ninth and twelfth grade scores ranged from .50 for the Home Economics curriculum to .29 for the Vocational curriculum.

Summary of Changes in Occupational Values

Because all of the values of the OVI are related to each other through the ipsative nature of the instrument plus the fact that Question #1 is addressed to change in all seven values, it was considered appropriate to report the conclusions which may be drawn when considering the overall changes in occupational values from ninth to twelfth grade. The data presented here is taken from Tables 1 through 7. Five of the occupational values of the OVI changed significantly at the .05 level, due to the effects of time. The values Advancement and Personal Goal

were the two values which did not show a significant change during the high school years. Of the five values which showed a significant change, the average value for Interest and Satisfaccion, Salary, and Preparation and Ability increased from ninth to twelfth grade while the average value for Prestige, and Security decreased. The value of Advancement was the only value to have a significant ($P<.05$) interaction but for that analysis the Box test yielded a significant Chi-square which made the conclusions drawn from that ANOVRM dubious. It would appear then, that although most occupational values tend to change during the high school experience, the change is largely independent of the particular curriculum in which the student is enrolled and is more dependent on time. Overall, the variability of scores, reported as standard deviations, remained fairly constant across curricula. An overall increase in variability was reported for four values with a decrease reported for the other three, but none of the standard deviations changed more than one point.

Table 8 reports all the significant simple effects by level of significance. From the table it can be seen that students who are enrolled in the Home Economics curriculum tend to have an occupational value structure in the twelfth grade which is very much like their ninth grade occupational value structure; in fact, no significant change was observed in any occupational value for the Home Economics curriculum, which is comprised mainly of females (2 males, 41 females). In reviewing Tables 1 through 7 there was no definite trend in the way in which mean scores for the Home Economics curriculum varied from the grand mean, but the direction of change usually corresponded to the direction of

TABLE 8. Probability of Obtaining a t-ratio for the Seven OVI Values Reported by Curriculum. (TOTAL N = 659)

| Value | Curriculum | | | | |
|---|---|---|---|---|---|
| | Voc. (n=188) | Aca. (n=291) | Sec. (n=72) | Bus. (n=69) | H.E. (n=43) |
| Interest and Satisfaction | | **[b] | | *[a] | |
| Advancement | | | | | |
| Salary | ***[c] | *** | ** | ** | |
| Prestige | *** | *** | *** | * | |
| Personal Goal | | | | | |
| Preparation & Ability | | ** | *** | * | |
| Security | *** | *** | *** | * | |

[a] * indicates significance at .05 level

[b] ** indicates significance at .01 level

[c] *** indicates significance at .001 level

change observed for the grand mean. The Business and Academic curricula recorded the largest number of significant changes (five) from ninth to twelfth grade. Although both the Academic and Business curricula yielded significant changes for the values Interest and Satisfaction, Salary, Prestige, Preparation and Ability, and Security the degree of change was always less for the Business curriculum. The values of Advancement, and Personal Goal were the only values which did not change significantly for any of the five curricula from ninth grade to twelfth grade.

Question #2

Research has shown that vocational maturity scores increase over time. For vocational maturity as measured by the VDI in ninth grade and again in twelfth grade:

a. Is there a change due to time?

b. Does the amount of change differ among the five curricula?

ANOVRM was utilized to answer both part a and part b of Question 2. The results of this test, descriptive data and the simple effects as they pertain to vocational maturity are reported on Table 9. Descriptive data and simple effects are reported by curriculum for readers who are interested in a particular curriculum. Through the application of the Box test it was determined that the basic assumptions of homogeneity of variance and correlation were met and, therefore, the results of the ANOVRM was valid. The resultant probability of 0.002 associated with the F-ratio for the ninth to twelfth grade source of variance indicates

TABLE 9. ANOV and Analysis of Simple Effects for 9th to 12th Grade Changes by Curriculum for the dependent variable Vocational Maturity.

ANALYSIS OF VARIANCE FOR REPEATED MEASURES[a]

| Source of Variance | Sum of Squares | Mean Squares | df | F-Ratio | Prob. |
|---|---|---|---|---|---|
| 9th - 12th Grade | 179.21 | 179.21 | 1 | 10.107 | 0.002 |
| Interaction | 123.24 | 30.81 | 4 | 1.738 | 0.140 |
| Error | 12678.54 | 17.73 | 715 | | |

DESCRIPTIVE DATA AND SIMPLE EFFECTS BY CURRICULUM

| | Curriculum | | | | | |
|---|---|---|---|---|---|---|
| Data Type | Voc. (n=194) | Aca. (n=323) | Sec. (n=76) | Bus. (n=78) | H.E. (n=49) | Total (n=720) |
| 9th Grade | | | | | | |
| Mean | 34.74 | 35.67 | 36.00 | 33.90 | 35.55 | 35.25 |
| S.D. | 4.95 | 4.71 | 4.86 | 4.53 | 5.38 | 4.82 |
| 12th Grade | | | | | | |
| Mean | 34.92 | 36.16 | 37.34 | 35.92 | 36.71 | 35.96 |
| S.D. | 6.26 | 6.48 | 5.18 | 5.43 | 6.82 | 6.21 |
| Simple Effects | | | | | | |
| Correlation | 0.44 | 0.40 | 0.55 | 0.51 | 0.45 | |
| t-ratio | -0.42 | -1.38 | -2.46 | -3.59 | -1.25 | |
| Probability | 0.678 | 0.168 | 0.016 | 0.001 | 0.217 | |

[a]The Box test for homogeneity of the covariance matrix of independent groups indicates homogeneity of variance and correlation at the .05 level.

that the change in vocational maturity across all curricula, as measured by the VDI, was significant. The actual change due to time although significant was quite small. The difference between the ninth grade grand mean (35.25) and the twelfth grade grand mean (35.96) was only 0.71. The probability which was associated with the interaction term indicated that there was no significant interaction between curriculum and time. Therefore, we may conclude that there was a significant ($P<.01$) change in the vocational maturity of high school students from ninth to twelfth grade but that the change was not different among the five curricula.

The analysis of the descriptive data and simple effects disclosed that although all curricula record an increase in vocational maturity scores, only the Secretarial and Business curricula were associated with significant increases ($P<.05$). It should also be noted that the standard deviation for each curriculum increased from ninth to twelfth grade. The Vocational students had a lower twelfth grade mean score than students in any of the other four curricula. Students enrolled in the Secretarial curriculum had the highest mean score in both ninth and twelfth grades. The correlation between ninth and twelfth grade vocational maturity scores in each curriculum ranged from .40 to .55.

Question #3

The post high school educational plans of high school students have been shown to change from ninth to twelfth grade:

a. Is there a change in post high school educational plans (college versus non-college) due to time?

b. Does the amount of change differ among the five curricula?

ANOVRM was conducted to answer both parts of Question 3. The results of this test along with the descriptive data which corresponds to this question and a dependent t-test, comparing ninth and twelfth grade data for each curriculum are reported in Table 10. The Box test, which tests the assumptions of homogeneity of variance and correlation, indicated that these assumptions were violated for this test. Therefore, an investigation of the main effects is questionable and conclusions from these results should be interpreted with caution. When interpreted, however, the results of the analysis of variance indicated that there was a change in post high school educational plans from ninth to twelfth grade, but that the amount of change did not differ among the five curricula. Since the basic assumptions of ANOVRM were not met the simple effects by curriculum need to be investigated.

Before discussing the simple effects it may be helpful to point out that the reported mean scores, in this case, contain additional information. Due to the fact that "non-college" plans were coded 1 and "college" plans were coded 2 the decimal portion of the mean scores is equal to the percent of students aspiring to attend college. For example, if all of the students in a particular curriculum had "non-college" plans their mean score would be 1.00 with .00 percent planning to attend college. On the other hand, if the students in a curriculum

TABLE 10. ANOV and Analysis of Simple Effects for 9th to 12th Grade Changes by Curriculum for the dependent variable Post High School Educational Plans.

ANALYSIS OF VARIANCE FOR REPEATED MEASURES[a]

| Source of Variance | Sum of Squares | Mean Squares | df | F-Ratio | Prob. |
|---|---|---|---|---|---|
| 9th - 12th Grade | 3.01 | 3.01 | 1 | 24.460 | 0.001 |
| Interaction | 0.74 | 0.18 | 4 | 1.505 | 0.199 |
| Error | 85.75 | 0.12 | 697 | | |

DESCRIPTIVE DATA AND SIMPLE EFFECTS BY CURRICULUM

| | Curriculum | | | | | |
|---|---|---|---|---|---|---|
| Data Type | Voc. (n=204) | Aca. (n=307) | Sec. (n=71) | Bus. (n=70) | H.E. (n=50) | Total (n=702) |
| 9th Grade | | | | | | |
| Mean | 1.46 | 1.71 | 1.28 | 1.14 | 1.37 | 1.51 |
| S.D. | 0.50 | 0.46 | 0.45 | 0.35 | 0.69 | 0.48 |
| 12th Grade | | | | | | |
| Mean | 1.31 | 1.62 | 1.20 | 1.14 | 1.33 | 1.42 |
| S.D. | 0.46 | 0.49 | 0.40 | 0.35 | 0.48 | 0.45 |
| Simple Effects | | | | | | |
| Correlation | 0.49 | 0.41 | 0.40 | 0.18 | 0.76 | |
| t-ratio | 4.45 | 2.91 | 1.51 | 0.00 | 0.53 | |
| Probability | 0.001 | 0.004 | 0.135 | 1.00 | 0.598 | |

[a]The Box test for homogeneity of the covariance matrix of independent groups indicates hetrogeneity of variance and correlation at the .05 level.

were evenly divided, that is, half with "college" plans and the other half with "non-college" plans, the mean score would be 1.50. This information was used in the interpretation of the simple effects.

When the simple effects were examined, it was discovered that the change in post high school educational plans varied widely among the five curricula. The amount of change from ninth to twelfth grade was significant at the .05 level for both the Academic and Vocational curricula, both of which were associated with a decrease in the number of students who planned to attend college. As might be expected from the nature of the curriculum, a larger percentage of Academic students planned to attend college at both points in time. In the ninth grade 71 percent of the Academic students planned to attend college and in the twelfth grade 62 percent had plans to attend college. On the other hand, the Business students planned to attend college less frequently than students enrolled in any other curriculum in both grade levels. Only 14 percent of the Business students planned to attend college in both ninth and twelfth grade. It was interesting to note that both the standard deviation and mean for the Business curriculum remained constant from ninth to twelfth grade. None the less, there were individual changes in the Business curriculum which occurred randomly, as evidenced by the low correlation ($r = 0.18$) between ninth and twelfth grade college plans. In the Home Economics curriculum the mean remained fairly stable, with 37 and 33 percent of these students planning to attend college in ninth and twelfth grades respectively. It was also observed that the correlation between the grade levels was much greater for the Home Economics curriculum ($r = 0.76$) than the correlations for the other

curricula. The conclusion drawn from this correlation was that individuals in the Home Economics curriculum changed their educational plans less frequently than members of other curricula. All curricula, with the exception of the Business curriculum, experienced a decrease in the number of students who planned to attend college during the high school years. When all curricula were summed together, 51 percent of the students planned to attend college when they were in the ninth grade and 42 percent of the same students planned to attend college when they were in the twelfth grade.

It should be pointed out that since the variable, Post High School Educational Plans, is dichotomous, the correlation is actually a Phi Coefficient which is a special case of the Pearson Product Moment Correlation.

Question #4

> Research has shown that aptitude scores as measured by the GATB increase with time. For Vocational students do aptitude scores as measured by the GATB in ninth and again in twelfth grade change due to time?

The dependent t-test was conducted for each of the nine GATB values for students enrolled in the Vocational curriculum in order to answer Question #4. The results of this test plus the descriptive data which corresponds to this test are reported in Table 11. The results of the dependent t-test for each of the nine GATB aptitudes indicated that the change in aptitudes from ninth to twelfth grade was significant at the

TABLE 11. Analysis of Simple Effects and Descriptive Data for 9th to 12th Grade Changes for the Nine Aptitudes of the General Aptitude Test Battery for Students Enrolled in the Vocational Curriculum. (N = 160)

DESCRIPTIVE DATA AND SIMPLE EFFECTS BY CURRICULUM

| | Aptitude[a] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Data Type | GATB-G | GATB-V | GATB-N | GATB-S | GATB-P | GATB-Q | GATB-K | GATB-F | GATB-M |
| 9th Grade | | | | | | | | | |
| Mean | 92.64 | 91.26 | 92.76 | 100.28 | 96.98 | 98.73 | 86.48 | 89.02 | 86.46 |
| S.D. | 12.17 | 9.92 | 12.78 | 14.89 | 17.28 | 11.46 | 16.94 | 19.86 | 20.37 |
| 12th Grade | | | | | | | | | |
| Mean | 103.30 | 97.61 | 103.23 | 110.21 | 109.79 | 108.92 | 104.82 | 103.61 | 106.62 |
| S.D. | 14.03 | 12.78 | 13.82 | 19.93 | 16.56 | 12.00 | 15.37 | 21.12 | 20.40 |
| Simple Effects | | | | | | | | | |
| Correlation | 0.76 | 0.77 | 0.74 | 0.69 | 0.67 | 0.64 | 0.66 | 0.41 | 0.50 |
| t-ratio | -14.54 | -9.87 | -13.73 | -8.66 | -11.76 | -12.96 | -17.28 | -8.28 | -12.53 |
| Probability | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |

[a]A description of the nine aptitudes can be found on pages 38 and 39.

.001 level. For each aptitude the recorded change was an increase from ninth to twelfth grade with the largest increase recorded for GATB-K which is the Motor Coordination aptitude. The least amount of change was displayed by GATB-V which is the Verbal aptitude. The twelfth grade means, for all but the GATB-V aptitude, were above 100 which was the mean for the GATB General Working Population Sample. The standard deviation increased from ninth to twelfth grade for all aptitudes with the exceptions of GATB-P and GATB-K. Correlations remained in the .60's and .70's for all of the non-manipulative aptitudes but were 0.41 for GATB-F and 0.50 for GATB-M which are the manipulative aptitudes. The answer to Question #4 which was concluded from the data presented in Table 11 was that for Vocational students, aptitudes scores as measured by the GATB in ninth and again in twelfth grades did change due to the effects of time.

V

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter provides a summary of this study, conclusions based on the findings, and recommendations which follow from the findings and conclusions.

## Summary

### Introduction

The comprehensive high school program has evolved within the American educational system as a means of providing all secondary aged youth with the educational experiences necessary to pursue their chosen careers. In recent times many of the most "sacred" American institutions have been under criticism and demands have been placed upon them to prove their worth to society. The public educational system has been included in this group of institutions and must demonstrate its value or loose the public support which its enjoyed throughout its existance. Educators have attempted to demonstrate the value of the educational system through evaluation of student outcomes. These evaluative efforts have generally investigated cognitive outcomes while ignoring the affective outcomes of education. In order to prove and/or improve the value of the educational system all aspects of student development must be investigated.

The affective domain deals with feelings, interests, attitudes, and values and is concerned with the performance of a task at the appropriate time. Through the efforts of various researchers, changes in selected affective behaviors throughout the high school experience have been documented. The affective behaviors under investigation in this study include occupational values, vocational maturity and post high school educational plans. However, when a change in one of these behaviors is noted, the question of how much of this change is due to time or physical maturation and how much is due to experience or learning must be considered. In order to consider this question, the various curricula which compose the program of studies in a comprehensive high school system were considered as different educational treatments. This decision was based on the assumption that by their very nature, each curriculum provides a different set of experiences for the students enrolled in it.

## Statement of Problem

This study investigated the change in various student characteristics from ninth to twelfth grade as they were related to high school curriculum. For the most part, the characteristics chosen for this study were of an affective nature, but a cognitive measure was included as a benchmark for comparison with the changes which occurred. In order to identify the effect of time and curriculum on the change that occurred from ninth to twelfth grade in the selected student characteristics, the following questions were posed:

1. Research demonstrates that work values tend to change over time. For each of the seven values of the OVI as measured in ninth grade and again in twelfth grade:
    a. Is there a change due to time?
    b. Does the amount of change differ among the five curricula?
2. Research has shown that vocational maturity scores increase over time. For vocational maturity as measured by the VDI in ninth grade and again in twelfth grade:
    a. Is there a change due to time?
    b. Does the amount of change differ among the five curricula?
3. The post high school educational plans of high school students have been shown of change from ninth to twelfth grade:
    a. Is there a change in post high school educational plans (college versus non-college) due to time?
    b. Does the amount of change differ among the five curricula?
4. Research has shown that aptitude scores as measured by GATB increase with time. For Vocational students do aptitude scores as measured by the GATB in ninth grade and again in twelfth grade change due to time?

Procedure

The sample utilized in this study was composed of Altoona Area School System students who were enrolled in the ninth grade during the spring of 1969 and who were also enrolled in the twelfth grade class during the spring of 1972. In order for an individual to be included in the sample he must have had a ninth and twelfth grade score on at least one of the dependent variables. Of the 1100 students who were included in the initial sample during the spring of 1969, 801 had sufficient data to be included in this study.

Ninth grade student characteristic data were gathered in the spring of 1969. During the spring of 1970 when the sample was in tenth grade, a record was made of the curriculum in which each student was enrolled. The five curricula in which the students were enrolled include: Academic, Vocational, Secretarial, Business, and Home Economics. Twelfth grade data were collected on the same student characteristics in the spring of 1972 from the senior class members of the Altoona Area High School. All data used in this study was gathered as a part of a longitudinal Vocational Development Study (VDS) being conducted by the Department of Vocational Education at The Pennsylvania State University in cooperation with The Pennsylvania Research Coordinating Unit.

Two points in time and the curriculum in which the students, included in this study, were enrolled during the mid-term of tenth grade (spring, 1970) were utilized as the independent variables the four dependent variables were: occupational values as measured by the OVI; vocational maturity as measured by the VDI; post high school educational plans; as indicated on both a ninth and a twelfth grade questionnaire

and for Vocational students only general abilities, as measured by the GATB. The ninth and twelfth grade scores on each of the dependent variables were used to determine the amount of change which had occurred in each of the variables during the high school experience.

Two Statistical methods were employed in the analysis of the data. The Two-way Analysis of Variance for Repeated Measures (ANOVRM) was employed to answer Questions #1, #2, and #3. The Dependent t-test was also employed in answering these three questions plus Question #4.

Findings

The ANOVRM indicated that the grand mean scores for five of the seven occupational values of the OVI and for both vocational maturity and post high school educational plans changed significantly ($P<.05$) between ninth and twelfth grades. Advancement and Personal Goal did not show a significant ($P<.05$) change due to time. The only interaction between time and curriculum determined to be significant at the .05 level was for the value of Advancement. However, for this particular test, the basic assumptions were violated. Therefore, these results could not be interpreted with confidence. The changes which did occur from ninth to twelfth grade on the dependent variables, Occupational Values, Vocational Maturity, and Post High School Educational Plans were due to time and did not vary significantly ($P<.05$) among the five curricula.

For students enrolled in the Vocational curriculum the change in aptitude scores from ninth to twelfth grade as measured by the GATB was significant at the .001 level for each of the nine GATB aptitudes.

## Conclusions

### Question #1

This question was concerned with the change which occurred in the seven values of the OVI from ninth to twelfth grade and whether or not the change which occurred varied among the five curricula. Although the changes in values were analyzed on an individual basis, it appears to be most useful to draw conclusions concerning change in the occupational values of adolescents by examining the total value structure. It was determined that the overall occupational value structure from ninth to twelfth grade was fairly stable when the rank order of the seven values was considered. Even though five of the seven occupational value grand means changed significantly from ninth to twelfth grades, there was only one change in the ranking of grand mean scores. The ranking of occupational values by grand mean scores from highest to lowest are listed in Table 12 for both ninth and twelfth grades. From Table 12 it can be seen that the only change in the value structure was due to the increase in the value score for Salary, which caused Salary to be ranked higher than Advancement at twelfth grade. This stability is in agreement with the findings of Dipboye and Anderson (1959) who also found that values tend to be stable throughout the high school years, indicating that values are well formed by the ninth grade. Although these findings are not in agreement with the shifts in values that Gribbons and Lohnes (1965, 1968) found over a seven year period, the fact that Interest and Satisfaction was the most popular occupational value is in agreement with their findings.

TABLE 12. Rankings of the Seven OVI Values by Mean Score for Ninth and Twelfth Grades.

| Ninth Grade | $\overline{X}$ | Twelfth Grade | $\overline{X}$ |
|---|---|---|---|
| Interest and Satisfaction | 19.60 | Interest and Satisfaction | 20.07 |
| Personal Goal | 18.41 | Personal Goal | 18.40 |
| Preparation and Ability | 17.33 | Preparation and Ability | 18.31 |
| Advancement | 13.39 | Salary | 15.31 |
| Salary | 12.52 | Advancement | 13.20 |
| Security | 12.09 | Security | 10.25 |
| Prestige | 11.63 | Prestige | 9.59 |

There were no significant changes found in the mean value score for either Advancement or Personal Goal. All other values exhibited significant changes for at least two curriculums. No significant change in the average value score for any of the seven occupational values was reported for the Home Economics curriculum. Home Economics students, on the average, have the most stable occupational value system, from ninth to twelfth grade, of any of the five groups of students in this study. This statement is supported by the lack of significant change for any occupational value plus the fact that the Home Economics curriculum displayed a higher correlation between ninth and twelfth grade scores on four of the seven occupational values than any of the other curricula. This noticeable difference between the Home Economics curriculum cannot be attributed alone to the fact that the enrollment in this curriculum is

comprised mainly of females since the Secretarial and Business curriculum also had a large percentage of females.

The correlation coefficients obtained for the individual curricula between ninth and twelfth grade occupational value scores were usually lower than, but did approximate, the stability coefficients obtained in the validation of the OVI as reported by Impellitteri and Kapes (1971, p. 26) on three occasions. For the value of Advancement, the Home Economics curriculum reported a correlation of .52 which was .01 below the total stability coefficient (.53) and .08 above the reported stability coefficient (.44) for females. The correlation (.40) reported for the Secretarial students for the value Preparation and Ability was just .04 below the reported stability coefficient for girls. The Home Economics curriculum, which was almost entirely composed of female students, exhibited a correlation of .50 between ninth and twelfth grade scores, for the value Security. This correlation is higher than the total stability coefficient (.49) and also higher than the stability coefficient for girls (.48) reported by Impellicteri and Kapes.

The most unstable occupational value systems observed were associated with the students enrolled in the Academic and Business curricula, both experiencing changes in five of the seven occupational values. The changes in the Academic curriculum were always greater than the change experienced in the Business curriculum. A conclusion which follows from the findings related to Question #1 is that students who were enrolled in the Home Economics curriculum tended to have their occupational value system reinforced throughout their high school experience more frequently than students in [illegible] curriculum and

that students who were enrolled in the academic curriculum had their occupational value system challenged to a greater degree than any other group. This phenomenon can be related to the career decision process. The students who enrolled in the Home Economics curriculum made a choice to prepare for a career with which they were obviously familiar, that of a homemaker or occupations closely associated with family life. The students who were enrolled in the Vocational, Secretarial, or Business curricula also made a career decision, which was a decision to follow a career with which they were probably not totally familiar. The information upon which these students based their decisions was probably mainly from outside sources and little if any was obtained through personal experience. Therefore, the experiences which they encountered in their chosen curriculum were less familiar and tended to challenge their occupational value structures in such a way as to change the students' occupational value system to one which was more congruent with those of individuals actively engaged in the students' chosen careers. The Academic students did not necessarily make any career decision, but did decide to prepare for further education. The Academic curriculum is a broad based curriculum, not designed to prepare students for any one career, but designed to give the student a variety of exposures so that he will be able to prepare for a career in one of many occupations which require post-secondary education. Therefore, this curriculum does not have a tendency to reinforce any particular occupational value structure. Rather, it presents new experiences which may stimulate change in the existing occupational values of the students enrolled in this curriculum.

Question #2

This question was concerned with the change which occurred in vocational maturity, as measured by the VDI, from ninth to twelfth grade and whether or not the change which occurred varied among the five curricula. Although Crites (1971, p. 38) did not report a grand mean for twelfth grade the difference between the ninth (37.36) and eleventh (38.38) grade grand means is 1.27. This is a much greater increase over a two year period than was observed in this study which spanned a three year period. In fact, only the Secretarial and Business students exhibited an increase in VDI scores as great as that reported by Crites. Although statistically significant, the average observed increase across all curricula combined is only .71 units. It appears that although vocational maturity does increase through the high school years the increase is not great. The variability of VDI scores increased overall for each of the five curricula. This is in direct contradiction with the findings of Crites (1971), who concluded that the variability of VDI scores decreased as grade level increased.

The Vocational students had the lowest VDI scores of any of the five curricula in both ninth and twelfth grades. This fact supports the findings of Bathory (1967), Dutt (1968), and Halloway (1967). Gribbons and Lohnes (1968) and Impellitteri et al. (1969) found that college preparatory (Academic) students scored consistently higher on the VDI than other groups did. In this study the Secretarial students reported the highest mean score on the VDI in both ninth and twelfth grades which again seems to contradict prior research.

The female dominated curricula, Secretarial, Business, and Home Economics, evidenced the largest average increase in VDI scores from ninth to twelfth grade while the male dominated curriculum, Vocational, displayed the least amount of increase. The sex differences among the five curricula seems to be an important difference in terms of the amount of increase in VDI scores from ninth to twelfth grades.

Question #3

This question dealt with the change which occurred in the post high school educational plans of high school students from ninth to twelfth grade and whether or not the change which occurred varied among the five curricula. Students, when questioned during twelfth grade, planned to attend college less frequently than they had previously indicated during the ninth grade. The observed decrease in the percentage of students who planned to attend college from ninth (51%) to twelfth (42%) grade was in agreement with the findings of Gribbons and Lohnes (1968). Only the Vocational and the Academic curricula experienced a significant decrease in the number of students who planned to attend college. The Business curriculum displayed no overall mean change, however, the individual students in the Business curriculum changed their plans most frequently as evidenced by the relatively low correlation (.18) between ninth and twelfth grade post high school educational plans. Gribbons and Lohnes (1968) also found that the post high school educational plans were stable for the Business curriculum in their sample. Again the Home Economics students were individually the most stable as evidenced by the high correlation (.76). The change in post high school educational

plans which was observed may have been due to the fact that ninth grade plans acutally tend to be more like aspirations since they do not require that definite action be taken in the near future. On the other hand, twelfth grade post high school educational plans are concerned with actions that need to be taken in the near future and, therefore, are much more realistic. This change could be interpreted as an increase in vocational maturity because students seem to be making more realistic plans.

Question #4

This question was concerned with the students who were enrolled in the Vocational curriculum and the change which occurred from ninth to twelfth grade in their aptitudes as measured by the GATB. This question was included as a bench mark for comparison between the changes which occurred in the affective and cognitive domains from the ninth to twelfth grades. The results of this study are basically in agreement with the findings of Droege (1966, 1968) in that the mean scores increased for all nine of the aptitudes measured. The twelfth grade mean scores for all aptitudes except GATB-V, were above 100, which was the mean for the GATB General Working Population Sample. Droege (1966) also found that the variability generally increased from ninth to twelfth grade, and the results of this study supported this previous finding.

The variability of cognitive elements tended to increase due to the effects of maturation. This trend was also noted in the elements of the affective domain studied in this paper. Another form of

variability of OVI scores is the differential between the highest and the lowest value score. This differential also increased from ninth to twelfth grade, 7.97 and 10.48 respectively. The variability reported for post high school educational plans cannot be appropriately discussed here due to the dichotomous nature of this variable.

All nine of the GATB aptitude scores increased significantly from ninth to twelfth grades. Since the scores of the OVI are all related due to the ipsative nature of the instrument (i.e. the total derived by adding the seven value scores must equal a constant), as the scores for some values increase others must decrease. Thus it is not possible for all of the OVI scores to increase. The values which were ranked the highest in the ninth grade value structure tended to increase due to the effect of time while the two least popular values decreased very significantly ($P<.001$) from ninth to twelfth grade. There was also a significant ($P<.002$) increase in the grand mean score for vocational maturity.

The affective measures dealt with in this study tended to exhibit a change due to time and maturation, which was consistant with the change which occurred in the cognitive domain as measured by the GATB. The evidence presented here indicates that as high school students mature they tend to become more diverse in their characteristics as indicated by the increased variability of the measures in both the affective and cognitive domain from ninth to twelfth grade. While the changes found generally hold true without respect to curriculum, there are specific instances where the curriculum appears to play a major role.

## Recommendations

In view of the findings and conclusions drawn from this study, the following recommendations are made:

1. A study of a similar nature should be conducted using sex as the independent variable to determine the relationship between sex and the change which occurs in the criterion variables.
2. The relationship between desirable student outcomes and the change in students' affective characteristics throughout the high school years should be investigated. Such an investigation would supply more information about the affective changes which occur in adolescent and their effect upon outcomes of the socialization process.
3. Due to the conclusion drawn in this chapter which dealt with the relationship between change in values and career decision making, it is recommended that research be conducted to determine whether or not students tend to alter their occupational value structures to have them become more congruent to the occupational value structures of persons engaged in careers which the student intends to persue.
4. The stated objectives of the various curricula studied here involve career objectives. Entry into a particular curriculum, therefore, requires a commitment to a specific occupation or a general class of occupations. It is recommended that research be conducted to determine the relationship between strength of occupational commitment of high school students and the change in their occupational value structure.

5. Since the occupational value structure of high school students is fairly stable from ninth to twelfth grade, consideration should be given to using values information as a counseling tool.
6. Since the students studied here increased their vocational maturity from ninth to twelfth grade, and since quality of career decision making is a function of vocational maturity, consideration should be given to the possibility of delaying specific occupational decisions during the high school years to take advantage of students' increased career decision making ability.
7. Since 38% of the academic students, when sampled during the senior year, did not plan to attend college, the academic curriculum should provide experiences in which employment skills are emphasized.
8. The results of this study indicate that students become more diverse in their characteristics as they mature. Therefore, the curricular offerings should become more diverse for students in the higher grade levels to allow for, and encourage, the expression of the various student interests, aspirations and goals.

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