FACTORS RELATED TO CHANGE OF MAJOR

BY COLLEGE STUDENTS

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FACTORS RELATED TO CHANGE OF MAJOR

BY COLLEGE STUDENTS

DISSERTATION

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By

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CHAPTER I

INTRODUCTION

The practical aspects of choosing as a life's work that which one likes best to do have long been recognized. Hall indicated that to be successful, a man should like his work better than anything else (3, p. 288). The motivational value of having an interest in the work one is doing is constantly being given more consideration in vocational counseling and industrial placement. This concern is justified in that work consumes a major portion of people's time and energy, and satisfying experiences in this area can make a major contribution to the individual's total happiness and satisfaction.

Methods of measuring interests grew out of this need for determining what people would like best to do. As more stress was placed upon satisfaction as a source of motivation for work or study, the more important became the need to find methods by which to determine interests of students or workers. Previously, success in study was considered to be its own source of motivation, but William James (5, p. 402) advanced the idea that one learns only what he is interested in learning. He felt that if one lacked interest
in a subject our learning of that subject would be ineffective. This type of thinking caused educators to become concerned with whether or not the student had interest in the study he was attempting to learn, as well as whether or not he had the ability to learn it efficiently. Neither educators nor vocational counselors were satisfied, however, when the instruments were developed that gave indications of vocational interests of persons. They also felt they needed to know whether or not the vocational choice of a student would be likely to change during the time he was preparing to enter the vocation. They also needed to know what factors might cause interests to be unstable or what would cause them to remain constant.

Further, if a student were unable to complete the course work required for one major, it would be valuable to determine whether or not he would be able to develop satisfactory interest in a new vocation which involved differing types of work. If, for example, a student had a very strong interest in the field of science as indicated by a high score in science on an interest inventory, but was unsuccessful in his study of that field, and if his interests were not likely to be modified so that other work would replace science as his primary interest, he might experience difficulty in finding a vocation from which he could derive satisfaction.
Most of the studies of stability of interest have shown a trend toward establishing the stability of interest, particularly in older men, and little has been done to discover what has caused any change that has occurred. Strong states:

The primary conclusion regarding interests of men between 25 and 55 years of age is that they change very little. . . . At 25 years of age he is largely what he is going to be and even at 20 years of age he has acquired pretty much the interests he will have throughout life (11, p. 313).

However, other studies (9, pp. 646-648) indicate that college students change major and change interest. Fryer states:

Prediction that the specific vocational interest of a youth one year from now will be the same as his present vocational interest has no better than fifty chances in one hundred in being correct. For periods longer than one year the chances that this vocational interest will not be the same are greater than the chances that it will be the same.

For the teacher offering educational guidance, the counselor offering vocational guidance, or the employer seeking an apprentice, to use an expression of interest as a guide to future plans, is a very unscientific and impractical way of achieving an adjustment. The vocational interest estimate is of little importance for prediction. It is only significant when linked with other significant criteria of selection and guidance (2, pp. 153-157).

Fryer also found that approximately 17 per cent of college students changed major before the sophomore year, and approximately 71 per cent changed major during the first three years of college (2, pp. 153-157). This was similar to the findings of Sisson when he found that 13 per cent of the
college students in his study wanted medicine at the end of one year and only 9 per cent wanted it at the end of three years (9, pp. 646-648). He also found 25 per cent of entering students wanted to study law and medicine, but at the end of three years only 18 per cent of the group named one of them as a major. He also found that 10 per cent expressed an interest in teaching as a vocation when they entered, but 20 per cent named it as their major after three years of college. No attempt was made in this study to estimate or account for any concomitant change of interest (9, pp. 646-648).

Several studies relating to change of major by high-school students are listed by Williamson which would indicate that approximately 50 to 80 per cent of high school students change their vocational objective at least once during high school (13, pp. 408-409). Douglas studied the vocational choice of 2,844 high-school students and found that 54.6 per cent were planning for a different vocation than they had previously decided upon sometime in the past (1, p. 82).

These studies mentioned above have indicated that many students change their vocational objective during the time they are preparing for their life's work. Although Strong indicated that the interests of men in the college-age group are quite stable, he recognized that some changes occur
during the high-school and college years (11, p. 366). In

discussing permanence of A, B, and C ratings\(^1\) he states:

Roughly there are 45 chances in a hundred that the
same rating will be obtained on retest within five
years, 75 chances that the same rating or one just above
or below it will be received, and 90 chances that the
second rating will be within two steps of the first
rating (11, p. 366).

In explanation of these ratings he says:

Roughly we may say that 40 per cent of the actual
changes are due to unreliability of the scales and 60
per cent to lack of permanence of interests.

Part of the change is caused by forcing responses
into one of three categories, part is caused by in-
creasing maturity common to men in general, and part
is caused by true shifts in interests because of in-
dividual experience. When these factors can be dis-
entangled, it is confidently expected that true changes
in interest-test scores because of lack of permanence
will be found to be relatively slight (11, p. 366).

In concluding his chapter on permanence of interests
he states:

Vocational interests found among college students
and to a lesser degree among juniors and seniors in
high school cannot be attributed to formal training
or experience in those pursuits. Hence it appears
that the interests characteristic of occupational
groups are present to a large degree prior to entrance
into the occupation and so are presumably a factor in
the selection of the occupation (11, p. 366).

\(^1\)Strong defines these ratings as follows: "The rating
A means that the individual has the interests of persons
successfully engaged in that occupation; the rating C means
that the person does not have such interests; and the rat-
ings B+, B, and B- mean that the person probably has those
interests, but we cannot be sure of the fact as in the case
of the A rating."
This would leave one with the implication that interests dictated occupational choice and that they were not in turn influenced by experience common to the years in which the individual was in the process of training. Yet, it is known from the studies of Sisson, Williamson, and Fryer that while in school students change major and change interest, although the causes of change of major and change of interest have not been well established.

It would seem quite reasonable to assume that the changes in major that were made by students while they were in school were closely related to their experiences during those years of preparation. It also might be assumed that these experiences influence their interest in various types of work. As they learn more about the kind of work done by persons working in the field of their chosen major, they may decide against further study in that area. As they become acquainted with the fact that tedious and monotonous study is expected of them, they may look for a vocation that offers less tedium and more variety. When they become aware that even hard work and much sacrifice may not be enough to assure success, they may look for other fields where the rewards may appear to be more certain, if not as great as in the field of their original choice. Since there are a number of studies indicating that students in high school and in college change vocational objective, and since change of interest may be associated
with such change, a study of change of major and associated change of interest might illuminate this relationship.

Although vocational and educational guidance is, to a certain extent, available to most high-school and college students, many freshmen enter college without an adequate appraisal of their ability to cope mentally with the type of college work required for successful study of their chosen field. Neither are they aware of the relative difficulty of subjects in that course of study nor do they know about the nature nor amount of other courses that are requirements for completing their study. In her study of elimination of women students from liberal arts colleges, Pope found that withdrawal of students ran as high as 72.5 per cent of those who entered (8, p. 21). In another study Hanna found that of nearly 8,000 students who entered the 35 junior colleges included in his study, only 36 per cent finished in the regular two years (4, pp. 1-8). In a study of student failures at the University of Oklahoma, Vogt found that over 11 per cent of 4,198 students failed in two or more subjects, and of the number failing approximately one half were freshmen and almost one quarter were sophomores (12, pp. 847-848). In discussing unwise choice of courses and curricula Williamson states:

... it is also probably safe to assume that most students do not fail courses which are consonant with their abilities and interests. For, by and
large, a high incidence of scholastic failure indicates many large choices of courses (13, p. 251).

A study by Sparling indicated that 42 per cent of a class of ninety-two seniors at Long Island University had changed their vocational choice after entrance into the university, and that 23 per cent of 860 students in the same university changed major before the end of their first year in college (10, pp. 33-34). There are a number of other factors of a more personal nature that are given as reasons why students change major. Even though students entering college have available to them some information on what college will cost, they frequently have inaccurate knowledge of what the total cost will be. This is particularly true if completing their program of study involves going to a professional school. Even when expenses are carefully estimated, students frequently overestimate their part-time earning ability or the ability of their parents to assist them. This results in the necessary curtailment of the planned period of training and the choice of a new major that is thought more likely to be within the scope of their financial ability.

Attitudes of other students or of faculty members can cause students to feel that a given major is too easy to be worth while studying, that it would carry with it very little prestige. If students acquire this feeling with regard to their chosen major, they may tend to leave it
in favor of one which gives them more of the prestige which they seek.

A trend that was discovered by Strong is the tendency toward the development of interest in being of service to people (11, p. 300). This seems to occur during the college years and might influence students to change to a major which would give them more opportunity for such service. Since parents frequently are very influential in causing students to choose a major, their influencing students to change major must also be considered as important.

These studies have indicated that many students change major during their stay in college. They also list a wide range of factors as having possible relation to such change. However, they gave little evidence to show what were the more common causes of change of major although the numbers of students involved would seem to justify the study of this problem.

Need for This Study

Most studies on the subject indicate that from 40 to 70 per cent of college students change major at least once during their period of study. This is an inefficient situation because it not only is frustrating and costly to the student who has to change, but because it is also costly to the school. The student frequently has different
requirements to meet in the new course of study so that he must take more than the usual number of course hours to graduate. This tends to increase his period of training and the related expense.

If there are factors related to change of major and change of interest that could be determined at time of entrance and if counselors could know what relationship exists between these various factors and change of major they could be more realistic in advising with college students regarding vocational choice. Study to determine factors associated with change of major is needed in order that counselors may have more information with which to assist students in making either a choice of major or in choosing subjects until they are ready to declare a major.

Statement of Problem

The problem of this study is to discover what factors are associated with change of major in college students. Questions that need to be answered are (1) Is academic success or failure related to change of major? (2) Is mental ability associated with change of major? (3) Is change of interest related to change of major? (4) Are there reasons that are personal and peculiar to the individual that are associated with change of major? (5) Is inadequate occupational information related to change
of major? (6) Do social reasons such as a desire for a vocation with greater prestige, increasing interest in being of service to people, or having to conform to the wishes of parents and relatives relate to change of major?

The answers to questions one, two, and three were sought by means of quantitative methods because pertinent, objective information was available in such forms as mental ability test scores, grade averages, and interest test scores. The answers to questions four, five, and six were sought from more subjective sources such as responses to questions on questionnaires and responses in personal interviews. It was the function of this subjective information to delineate those personal reactions to requests for information pertaining to their own peculiar situations.

Hypotheses

1. Students who are unsuccessful in academic work required by their major show greater tendency to change major than students who are successful.

2. Mental ability is related to change of major in that students who change major will show less mental ability as indicated by total raw scores on The American Council on Education Psychological Examination than will students who do not change major.
3. Students who change major will show greater tendency to change interest than will students who do not change major.

Definition of Terms

Subjects.—The subjects of this study were male and female students who had completed more than one year of college and who had registered for an academic load of twelve or more semester hours each semester for not more than six regular semesters.

Original test.—The Kuder Preference Record, Vocational, Form B is the original test and the retest for this study.

Major.—A major refers to completion of a minimum of twenty-four semester hours of designated work in one subject area.

Change of major.—Change of major refers to a decision of a student to discontinue study of courses in one department as a specialization and take up study in a different department. It involves meeting the minimum requirements for graduation as designated for majors of the department in which he has decided to study.

Success.—A student is considered to be successful if he is meeting the requirements for graduation from the University. This means he must be making an over-all average of C and must be making an average grade of B in the subjects of his major.
Interests.—The interests referred to are the scores on any one of the nine scales of the Kuder Preference Record, Form B that result from the tabulation of the expressions of preferences for certain activities.

Questionnaire on Persistence of Choice of Major in College.—Advanced students in three different colleges were asked to list the reasons they changed major. Their statements were reworded and generalized slightly to make them acceptable without self-effacement but not enough to alter their meaningful nature. Stated in a positive form, these were used to construct Form I of the Questionnaire on Persistence of Choice of Major in College, which was administered to those students who changed major. In Form II, which was administered to those people who had not changed major, the ideas were each presented in such a manner as to be the direct opposite of the statement in Form I of the questionnaire.

Limitations

The study was limited to students enrolled in full-time study at Texas Christian University. Full-time study refers to being registered for twelve or more semester hours of work per semester. The subjects were those who had taken the Kuder Preference Record, Form B and the American Council on Education Psychological Examination for College Freshmen, 1954 Edition at the time they enrolled in the University as
freshmen. These students were retested with the Kuder Preference Record, Form B after they had completed two regular semesters of work and before they had completed six semesters of work. They were enrolled for these periods during the years from 1955 to 1960.

Procedures and Methodology

Sources of Data

Data for this study were obtained from five sources. The test scores of the Kuder Preference Record, Form B and the total raw scores on the American Council on Education Psychological Examination, 1954 College Freshmen Edition were obtained from freshman orientation test records of the students who participated in the study. The latter were used as an indicator of mental ability. These tests had been administered at the time the students had entered college as freshmen. The retest scores were obtained by readministering the Kuder Preference Record, Form B.

The data on success in study were obtained by the examination of the individual records of the students as maintained by the University. The reactions of the students to the Questionnaire on Persistence of Choice of Major in College were obtained by having the students mark them at the time they were retested. Individual interviews were also conducted with the students with a view of obtaining
more holistic information on factors associated with change of major and change of interest.

**Procedures for Collecting Data**

These data were obtained in two different ways. Groups of students who had signified a willingness to cooperate in the study took the *Questionnaire on Persistence of Choice of Major in College* and were retested in groups with the *Kuder Preference Record, Form B*. Later these students were interviewed individually. This provided opportunities for reexamining the questionnaire as well as giving an opportunity to discuss factors relevant to the change or persistence of their major.

Individual students who visited the Guidance Center were retested with the interest test and filled out the questionnaire. They were also interviewed for the reasons stated above. These were students who either came to the Testing Bureau on their own initiative for counseling or were sent in by their academic counselors in connection with a change of major.

**Procedures for Treatment of Data**

The objective of this study was to discover what factors were associated with change of major by college students. Two general types of procedures were used to show what relationships existed. Where objective data
were available, quantitative methods were used to show group
trends. Where simple tests of independence or association
were called for $X^2$ was calculated according to McNemar's
formula (85) (7, p. 200). Where test scores were examined
for significant differences, McNemar's formula (91a) for
calculating difference between uncorrelated means was used
(7, p. 224). Where tests of significance of mean change
scores were made, Fisher's $t$ for related groups was calculated.

Where the sources of the data were the questionnaire
and interviews with students, they were considered to be
qualitative in nature rather than quantitative. However,
the replies of the students in each group to the questions
on the questionnaire were converted to percentages of the
group answering each question in a positive manner. Infor-
mation obtained from interviews was used to explain and il-
luminate the replies of the group to questions concerning
persistence of major.

Grade-point average as figured by Texas Christian
University was used to indicate success or lack of success;
that is, $A$ yields four honor points per semester hour; $B$
yields three honor points per semester hour; $C$ yields two
honor points per semester hour; $D$ yields one honor point
per semester hour; and $F$ receives no honor points. An over-
all average of 2.00 is required for graduation, and an
average of 3.00 is required in the major field.
Students were considered to be unsuccessful if they failed to meet these standards. If they equalled or exceeded these requirements, they were considered to be successful.

The Questionnaire on Persistence of Choice of Major was used to obtain information on what reasons students gave for changing or not changing major. Since in each case their "Mostly true" answers indicated positive statements as to why they did what they did, the "Mostly true" answers were considered to be the answers relative to the purpose of the questionnaire, and the answers "Mostly false" and "Does not apply" were considered together as negative. The count of answers in the "Mostly true" column was converted to proportions of each group for the purpose of expressing the replies of the group to that question.

The data that were obtained by means of interviews were included in narrative form for the purpose of presenting a more holistic view of the motivation of individuals with regard to the persistence of their choice of major or their reason for change. The subjects were selected with the purpose of obtaining reactions of students who had completed one or more years of college and had attempted some of the required courses in the area of their specialty.
The Study Groups

The subjects for the study were taken from the student population of all the colleges of the university at which the study was conducted. The basic requirements for selection of subjects were that they had to be either sophomores or juniors who had entered the university as freshmen and had been enrolled for twelve or more semester hours each semester since that time. They were obtained by administering the interest retest and the questionnaire to sophomore and junior level classes and selecting from this group the individuals who met the requirements. Many who met the basic requirements were not used for the quantitative studies because they did not take the needed tests at time of entrance.

For some of the phases of the study, students were selected with a view of controlling, or holding constant, the effects of certain factors. Students majoring in engineering and physics who met the basic requirements and who had taken the interest test and mental ability test were added. This was done to control the independent variable of subject matter. This also controlled original interest in that their interests had greater tendency to be similar than the interests of students in general (6, pp. 6, 10, 14).

Using these students as a homogeneous group, further studies were made of the relationship of success to change
of major, the relationship of mental ability to change of major and the relationship of change of major to change of interest.
CHAPTER BIBLIOGRAPHY


CHAPTER II

RELATED STUDIES

The term major, which refers to a student's area of specialization of study, has been associated almost exclusively with colleges and universities. It has come into broad and frequent usage only recently since these schools have increased and diversified their offerings to students. This diversification has resulted in having the scholars of one university studying in widely divergent curricula involving differing subject matter. Persons writing about the situation involving a change in the attitude of a student toward his major, whether it was a loss or gain in desire to follow further study or whether it was a decision to abandon it and study in another area, frequently spoke of this as a change of interest. As a result, when one inspects the literature dealing with permanence of vocational choice of college students, he immediately encounters terminology that is indefinite and difficult to interpret with confidence.

In discussing the relationship of vocational interests and vocational choice, Super says:

In considering the relationship of vocational interests to vocational choices, both terms need to be defined: there has been considerable confusion in
the literature because of failure to make adequate distinctions... An occupational choice may be expressed, that is, stated in response to a question. As numerous investigators have shown that the phrasing of the question has an important bearing on the amount of realism in the response, one should differentiate between expressed choice, preference and fantasy. Or a choice may be manifested, that is, demonstrated by participation in an occupation or preparation for it (16, pp. 375-385).

The earlier writers used the term interests in such a manner that they seemed to be speaking of vocational choices. Later writers used interests to mean expressions of preference for an activity or vocation, or they used the term when they were referring to interpreted, summed scores obtained from inventories of interest, and as late as 1939 Williamson spoke of vocational choice as choice of curriculum and not choice of major (19, p. 247).

In a later publication Super points out that there are "four major interpretations of the term interest connected with as many different methods of obtaining data" (16, p. 377). He refers to verbal expressions of an interest in an occupation as an expressed interest. He refers to participation in an activity as manifest interest. Interests measured by objective tests are referred to as tested interest while inventoried interest is the pattern of scores obtained from counting and giving weight to reactions to a series of questions on an inventory.

Obviously, Super's term expressed interests is practically synonymous with choice of a vocational objective or
major, and his term manifest interest is practically synonymous with participating in study for a vocation or doing the work characteristic of the vocation. Change of such interests would quite clearly represent change of vocation or change of vocational choice.

Dressel tried to clarify this situation somewhat when he wrote:

The word interests is used with several different meanings. The statements about stability apply largely to interests as measured by some such inventory as the Strong Vocational Interest Blank. Interests referred to in speaking about college majors or in educational goals frequently refer to expressed or stated interests (5, pp. 95-102).

In a number of publications the variety of meanings implied in the term change of interest can be understood only by careful scrutiny of the context of the article under consideration, and frequently the reader is left uncertain as to whether the reference applies to interests or vocational choice.

Since there is some indefiniteness as to what has been the meaning of the terms referring to vocational choice and interests, it was felt desirable at the outset of this study to define interests in terms of summed scores derived from interest inventories and to define major as a declared vocational choice or as entrance into planned training for a vocation.
Interests by such definition become rather definite and less abstract. They refer to scores that lend themselves to quantification and are no longer a verbally expressed liking for certain activities. Also when one makes a choice of major and enters into planned training for a vocation it becomes a part of his record. The person who activates a vocational choice not only is investing it with an expression of interest, but he is also making it a part of himself since he will be credited with the degree of success or failure that he encounters in the pursuit of his program.

A by-product of the diversification of college and university curricula was vocational guidance, which evolved from the early attempts at matching people and vocations. As individuals began to exercise more freedom of vocational choice, it became more and more apparent that individuals had interests and abilities suited to one vocation and not as well suited to another. Since interest in vocational guidance has been somewhat gradual in development, it was thought wise to use the historical approach in discussing the literature, since this offers an opportunity for the logical development of the subject. As a result, the articles bearing on the subject are reviewed according to the chronological order of their publication.

It might be interesting to note at the beginning that for change of major no studies of a monumental nature such
as Strong's study of interest were found. Although vocational choice and change of vocational choice as represented by change of major would seem to be a logical outgrowth of studies of interests, most research seems to have slighted this phase of the subject to concentrate on stability of interests. This has had a tendency to create the impression that once vocational counseling was completed and the counselor had declared a choice of major which was in agreement with his interest test scores, he could be sure that further vocational counseling would not be needed as far as he was concerned. However, as scientists continued to work in this area, they found that other factors besides interest entered into the permanency of vocational choice and that persons did shift from one field of study to another. The concern with this type of change was responsible for the usually brief references to change of major that are reviewed here.

Although he was speaking of the vocational choices of high-school students, Douglas published one of the earliest studies on the subject. He studied the vocational choice of 2,614 high-school seniors and compared them to their previous statements. He found that 54.6 per cent were planning for a different vocation than they had previously decided upon some time in the past (3, p. 82). He felt this indicated the need for more vocational counseling so that students might have a more reliable basis for vocational choice.
In his book *Measurements of Interests*, Douglas Fryer pointed out the changeable nature of vocational choice when he said that more than an expression of a choice of a vocation was needed before counselors or employers could be even fairly sure that vocational interests would be of a lasting nature. He considered such factors as experience in the field or entrance into training for the job to be more reliable indicators of permanent vocational choice than were verbal expressions of interest. He felt that people frequently said they were interested in a vocation because parents or teachers expected them to make some choice and since verbal expression did not involve more than minimal activity.

In studying change of major in college students, he found that approximately 17 per cent of college students changed major before their sophomore year and that approximately 71 per cent changed major during the first three years of college (*ibid.* pp. 153-157). He did not indicate, however, why the students changed major.

The need for information about choice of major was of considerable concern to Maverick, who observed that many students were having to change major. He advocated:

There should be set up in the University a committee on vocational guidance and that one of its duties would be disseminating among students
the information necessary to make an intelligent choice of a vocation and to arrange a course of study preparatory to entering the vocation chosen (9, p. 17).

He felt that vocational information should be made available on a compulsory basis to all students to help them avoid unwise decisions. His article also called attention to the fact that not all departments were aware of a need to counsel students with regard to changing a major, even when success in that study seemed to be unlikely or impossible. The faculty felt they were forced to deny credit to students who did unsatisfactory work, but they thought the department had no right to advise a student that he was unfitted, for example, to become a physician.

Another early study ascribed failure of freshmen and sophomores to poor choice of major and unwillingness to adjust to the reality of college. Vogt (17, pp. 847-848) felt that parents were too influential in the vocational decisions of students, which caused the students to lack interest and initiative. This left them unwilling or unable to work out the suitable solutions that they would have otherwise.

In a study of the vocational choices of school children, Lehman and Witty found that even at the early ages, children were already in the process of forming vocational decisions. They found that there was considerable change as they approached maturity. The study included school children
between the ages of eight and a half and eighteen and a half (8, pp. 253-265).

Neaoticin (10, pp. 59-69) found a high correlation between interest in a subject liked most and achievement in that subject. A five-point system was in effect at the school where he made his study, and under this system grades in the most-liked subject were 1.86 points higher than grades in all other subjects taken. In the most disliked course, they were 1.77 lower. This is one of the earliest articles pointing to the association between dislike for a course and inability to achieve success in the course.

In an article devoted to sources and permanence of interests of college men, Dyer discussed the relationship of time of vocational choice to permanence of that choice. He asked 101 college men when they had made their choice of a vocation. Of the thirty-two who said they made their decision before reaching high school, 90 per cent retained this choice five years after the time of questioning. Of the choices made during high school, 75 per cent were permanent, and of the choices made during college, 68 per cent were permanent (6, pp. 233-240).

He also asked them to make a rank order choice of four other vocations and in his follow-up asked if they entered into or stayed in these choices. He found that eighty-two of the one hundred one really first entered upon their
indicated first choice. Three others entered into related fields, and one eventually came back to his first choice after trying number four. Eighty-six of one hundred one really gave their first choice a tryout while nine entered their second choice and six began with a choice not even mentioned earlier. All of this would imply that students have a strong tendency to find employment in the fields that they have prepared for and that nearly two of three vocational choices arrived at in college are final. Conversely, it would indicate that more than one of three students who chose a major after entering college did not achieve success in choosing the correct one. It pointed up the need at this time for more adequate vocational counseling for college students and more occupational information.

More information on the subject of change of major was contributed by Sparling, who studied the vocational choices of 931 students at Long Island University. He found that 70 per cent of the group planned to enter the country's three most overcrowded professions. The net result of this was that 65 per cent of college students changed major during their college career. During the year of his study in which he tabulated the changes of major of freshmen, sophomores, and juniors only, he found that almost 23 per cent of the entire group changed major.
Thirty-four per cent of the freshmen, 19 per cent of the sophomores, and 39 per cent of the juniors changed major that year (14, pp. 33-34).

He felt this reflected the fact that many of these choices were made early and as a result could not have been made on realistic consideration of fact. He cited failure in courses requisite for the vocation as reason for change of major but presented no data to substantiate his conclusion in this regard.

The findings of Sisson (13, pp. 646-648) were much like those of earlier writers who studied the effect of unwise vocational choice on change of major. He found that 16 per cent of the undergraduate student body of Ohio Wesleyan wanted medicine while only 2 per cent completed undergraduate study in that field. Business was chosen by only 11 per cent of entering students, but of the graduating group, 34 per cent completed degrees in that field. Education was the declared major of only 10 per cent of entering freshmen, but by the end of the third year, 20 per cent of the group were preparing for teaching. A total of 83 per cent of the entering group wanted a professional vocation, but only 47 per cent completed professional study. An indeterminate number of these changed from one professional major to another during training.

Areas of study from which there was the highest degree of loss were medicine, chemistry, engineering, and law.
Areas of study which gained in enrollment were education and business.

A study by Wren (20, pp. 217-219) in which he related intelligence and scholastic success to persistence of level of vocational choice showed that regardless of low aptitude for a vocation, students were reluctant to scale down their level of vocational aspiration. He made this study in connection with the testing of 10,000 freshmen who were entering junior college. After administering the American Council on Education Psychological Examination, he selected two groups for comparison. One group was made up of those who made scores placing them in the upper 5 per cent on the basis of the national norm group. The second group was composed of an almost equal number of men who had made scores that ranked them in the lower 15 per cent when compared to the same norm group.

As freshmen 51 per cent of the lower group wanted to study for professional level vocations; 68 per cent of the higher group wanted such study. In spite of the fact that not one of them made a B average during their two years of college, 51 per cent of the low group still wanted the professions at the end of two years, and 42 per cent of the individuals in the low group made exactly the same choice as they had made previously.
In the high group 38 per cent changed major at least once while 58 per cent of the low group changed major. No study was made to determine what factors other than mental ability were associated with change of major nor were attempts made to show which majors lost students or which ones gained in choices.

Choice of curriculum, which was his term for choice of major, was given primary importance for the college student by Williamson (19). He felt it was the fundamental purpose of the counselor to help the student choose a major that was suited to his abilities as well as his interests so that the chances of failure or change of major would be reduced. Since most students have little or no help available to assist them in changing from one major to another, he felt it was important to counsel the student at the time he chose the original major rather than let him fail and take a chance on being able to change wisely and in time.

Required courses were listed by Williamson as a particularly disturbing factor which affects stability of vocational choice. Williamson said:

These arbitrary courses imposed on students often lack provision for individual differences and give rise to negative conditioning which usually results in an elimination of interests and meager results in academic work. Lack of motivation, low scholastic achievement, dearth of academic interest, vocational indecision, or wrong choice are a few of the maladjustments which may be traced to rigid requirements that do not fit the needs of students.
Counselors who were ignorant of institutional requirements as well as lacking knowledge of the counselee's abilities were blamed by Williamson for much vocational maladjustment and change of major. Family influence was also cited as being unreasonable and often the cause of student failure or change of curriculum. He also found that students frequently changed major to be able to take more courses under a teacher that they liked and frequently to avoid teachers that they did not like (19).

Drasgow found that 78 per cent of the graduates had a major picked before they entered college and only 35 per cent reported changing their major while in college. He felt that since he studied only graduates, this did not disagree with the findings of those who studied college students in general which, he said, indicated that the majority of college students changed majors at least once during their attendance at college. He also concluded that since his group of graduates had changed their major less often than the students in the groups of liberal arts students studied by other authors that students who graduate change their majors less often than students who do not.

In his search for reasons for change of major, he found that of all the graduates who had changed their major 85 per cent gave their reason to be interest. Some said they had lost interest in their old major, and others said they
had become interested in their new major. Drasgow felt that although interest was a very important factor in stability of vocational choice, it alone was not enough to account for the changes that took place. He put this into words when he said:

*Although the necessary data are not as yet available to test the following hypothesis, it is suspected that among a non-graduate control group, there is more to the changing of a major than could be accounted for by mere interest (4, p. 3).*

He found that fewer graduates than non-graduates changed major and attributed this to the fact that more of them had chosen their major previously to entering college and thus may have had more opportunity to be sure that their choice was suitable as well as to have a greater likelihood of having prepared for it better while in high school. This of course is not proof of his point since he did not make a study of those who chose major in high school to see what factors were associated with success and failure in college. Neither did he verify his conclusion, that lack of success was responsible for change of major, by producing any quantitative evidence.

In his book dealing with student counseling, Robinson stated that of the many students preparing for their chosen vocations, only a few of those who wanted to enter a profession would do so. Although they find themselves unable
to achieve successful progress, they find it difficult to consider a rather obvious solution, which is choice of another vocation. Robinson says:

"Their primary reason for this difficulty is a desire to protect their self-esteem, for they dislike admitting that they cannot make the grade. Furthermore, those whose optimum vocational level is probably below that of a profession react strongly if this fact is suggested to them (12)."

He felt that as students matured they were able to free themselves from such concern and be more realistic in their choice of major but even then they should be made to feel that they might not always wish to stay with one vocation and that changes should be encouraged.

Riley advocated much the same sort of attitude toward change of major as did Robinson. He felt that interest in a major was very important so that if you lost interest in one major you might do better to change.

He says:

"The important point to recognize is that when you pick your major in college, or when you select your job out of school, you are not necessarily committing yourself to that field for the rest of your life. Also the training you get will not be wasted if you do not remain in that field (11)."

He suggested that the student should explore the field of his choice before completing college to find the area that would permit him to make the fullest use of his natural abilities."
Carter studied the development of vocational interest in young people and arrived at the theory that their choice of a vocation came at the end of a series of activities during which a person was getting acquainted with the vocation and its requirements and associating them with his self-concept. If he was successful in his work, he identified with the group and gained prestige and satisfaction from it. If he was not successful, he had to start anew and form new identification and a new pattern of interests (2, pp. 185-191).

Carter felt that at the beginning interest patterns were a poor solution to the problem of adjustment. He said that attempts are made to make the solution work, but where it did not, a new vocation was chosen, and a new pattern was developed. If this choice met with success, it persisted; if it did not, he started over again. He did not show factual data to substantiate his theories, however.

Strong (15) made a follow-up study of young men who had been tested while in college eighteen years earlier. He concluded that their interests remained much as they were when first tested. More interesting here, however, were his conclusions with regard to the application of this to vocational stability. He felt that men who could enter training programs that are in keeping with their vocational interests tend to complete training if their interests are
appropriate and to drop out if they are not. In this case, they would enter similar vocations, and if they were not in line with their inventoried interests, they would tend to shift to others which were. He did not believe that lack of success might influence interest scores; he theorized that failure in calculus might cause the student not to like calculus but would not affect his liking for arithmetic, geometry, or algebra. He admitted, however, that his group was intellectually superior, had superior high-school records, and had scores well above the usually high scores required for admission. His most interesting conclusion was that people continued to like activities long after they had ceased to perform them and that one changed his liking for an activity only when he experienced unpleasantness with the activity (13).

Burnham made a study in which he conducted a test-retest of students between their freshmen and senior years, using the Strong Vocational Interest Blank. He concluded:

A student's tendency to change his responses between the first and second testing was not a chance affair but probably an indication of a real change of interest. However, this change was apparently little associated either with scholastic measures or with the type of educational program undertaken in college (1, pp. 332-335).

He found no relationship between inventoried interests and college grades. He related neither to change of major.

Dressel reviewed the research on interests with a view of pointing out the implications of the findings of
interest inventories. He cited the work of Lepsitz, who found that after a program was introduced in the vocational schools of Paterson, New Jersey, by means of which the students could explore various vocations, the number of changes in vocational choice ranged from 5 per cent of the entering class to 50 or 60 per cent. The work experience of the exploratory program was held responsible for most of the change (5). This would indicate that work experience would be a beneficial part of any vocational counseling situation and that if all counselees had some degree of work experience, their vocational decisions might be more realistic and lasting.

He criticized the work of Strong, who said that there was little change in interests of students, basing his statements on coefficients of correlation ranging from .56 to .71 and said that such coefficients would still allow for much change of interest.

He also concluded that decisions with regard to vocations, being much less specific and more broad in scope than interests, would possibly change even though interest scores for the same individual might not.

The likelihood that studies of stability of interests in college students were not realistic was also considered by Dressel. He saw that the studies would be biased by involving only students who remained in school.
He says:

Studies of the stability of interests in college students seem to have been biased by involving only students who remained in school. Students who have not arrived at definite choices or who might have had a definite change in interest are quite likely to become discouraged and drop from college. We know of no detailed studies of this particular point, but experience in follow-up of dropouts at Michigan State College indicates that this is a factor in some cases (5).

Dressel felt that in order to give vocational counseling greater certainty, counselors had been prone to overemphasize the stability of interest patterns of eighteen year olds. Such stability as did exist was considered by him to be a group phenomenon, and emphasis on it tends to ignore the marked changes evident in individual cases.

The effect of the experience of college is given careful and merited consideration here as an influence toward broadening the experience of college students as well as loosening the restrictions placed upon students by parents. Dressel feels that it should be expected that as students are exposed to the various sources of stimulation that characterizes the college atmosphere, their interests and some of their vocational choices will change.

The results of reviewing the literature on the subject of change of major point up the need for additional research in this area. It has been established that in spite of the commonly accepted statements to the effect that vocational
Interests do not change appreciably after the age of eighteen, many college students change major, and a predominate reason that they give is change of interest. Also, many students drop out of school because of lack of success or other factors so they are usually lost in studies of this type. It is possible that these lost sources of data could strongly influence studies that would have to be considered biased without them.

The constantly increasing scope of our knowledge and the requisite need for specialization if any student is to be maximally competent in one area seem, on one hand, to be dictating that students must start early to specialize if they are to be completely trained, and on the other to be saying that they should have more general education before they start their specialty. Not only is this true because they need a broad acquaintance with our cultural heritage but also because they need an acquaintance with the world of work so that they will be more certain of the field in which they wish to specialize.

The confusion between interests as represented by summed scores on an interest inventory and expressed interests such as a declaration of a major have left much of the meaning of research in the area of uncertainty. The persons who follow Strong tend toward emphasis of test scores and feel that expressed interests such as choice of major are
unrealistic and unreliable, but the importance of expressed interests can not be ignored in scientific research.

There is considerable evidence in the literature cited here which shows that, in spite of the allegations that vocational interests are stable and lasting, students change interest and change major. Some writers indicated that lack of success was an important factor; others felt that change of interest was an important cause while others indicated that low mental ability was a factor, but no study presented evidence showing clearly what factors were associated with change of major.

As long as 50 to 60 per cent of college students change major at least once while they are in college and as long as so little knowledge exists about why they change major, further research in this area would appear to be well justified.
CHAPTER BIBLIOGRAPHY


The Relationship of Success to Change of Major

The purpose of this study was to determine what factors are associated with change of major in college students. The first such factor to be considered was lack of academic success. The null hypothesis to be tested was: There is no difference between successful and unsuccessful students with regard to their tendency to change major. Students are considered successful if they met the requirements of C average in over-all grades and B average in their major subject. Students who were unsuccessful and withdrew or were suspended from school or who otherwise dropped out were not included in the study. The group was composed of equal numbers of sophomore and junior students and was composed of both sexes. The average age of the women students was 20.32 years, and the average of the men students was 20.4; less than a year's difference existed between the groups. The median age of each of the sex groups was 19. Sixty-two per cent of the men and 52 per cent of the women in the study indicated they had work experience related to their field of study. The data for subjects involved in this study are shown in Table I.
TABLE I
SUCCESS AND CHANGE OF MAJOR FOR COLLEGE STUDENTS

<table>
<thead>
<tr>
<th>Sex</th>
<th><strong>Did Not Change Major</strong></th>
<th></th>
<th><strong>Changed Major</strong></th>
<th></th>
<th></th>
<th><strong>Total</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Number</strong></td>
<td><strong>Successful</strong></td>
<td><strong>Not Successful</strong></td>
<td><strong>Number</strong></td>
<td><strong>Successful</strong></td>
<td><strong>Not Successful</strong></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>55</td>
<td>32</td>
<td>23</td>
<td>66</td>
<td>19</td>
<td>47</td>
</tr>
<tr>
<td>Female</td>
<td>46</td>
<td>43</td>
<td>3</td>
<td>32</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>101</td>
<td>75</td>
<td>26</td>
<td>98</td>
<td>37</td>
<td>61</td>
</tr>
<tr>
<td>% of Total</td>
<td>100</td>
<td>74</td>
<td>26</td>
<td>100</td>
<td>38</td>
<td>62</td>
</tr>
</tbody>
</table>
By calculating $x^2$ to test the hypothesis of no relationship between successful and unsuccessful students with regard to their tendency to change major, a $x^2$ of 26.45 was obtained which, for one degree of freedom, was significant beyond the .01 level of significance. (See Table II.) The hypothesis of no relationship was not accepted and the conclusion was that success was related to change of major.

TABLE II

<table>
<thead>
<tr>
<th>Group</th>
<th>Changed Major</th>
<th>Did Not Change Major</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful</td>
<td>a. 37 (55)</td>
<td>b. 75 (57)</td>
<td>112</td>
</tr>
<tr>
<td>Not successful</td>
<td>c. 61 (43)</td>
<td>d. 26 (44)</td>
<td>87</td>
</tr>
<tr>
<td>Total</td>
<td>98</td>
<td>101</td>
<td>199</td>
</tr>
</tbody>
</table>

$x^2 = 26.45$; d.f = 1; P lies beyond .001.

A second test of the same association was devised where only men were studied and where the students were all from the field of engineering and physics. This investigation was divided into two phases; the first was based on the first year of study, and a second was based on the second year of study. The first group consisted of 107 students
who had completed one year and were registered for the third semester of study. Of this group, 52 were successful and 55 were not successful. Of the successful group, 11 changed major when they registered for the third semester, and 41 did not change. Of the 55 who were not successful, 32 changed major while 23 did not. The result of calculating $x^2$ for this group is presented in Table III. Change of

### Table III

**CHI SQUARE TEST OF LACK OF ACADEMIC SUCCESS AND CHANGE OF MAJOR FOR ENGINEERING AND PHYSICS STUDENTS**

<table>
<thead>
<tr>
<th>Group</th>
<th>Changed Major</th>
<th>Did Not Change Major</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful</td>
<td>a. 11</td>
<td>b. 41</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>(21)</td>
<td>(31)</td>
<td></td>
</tr>
<tr>
<td>Not successful</td>
<td>c. 32</td>
<td>d. 23</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>(22)</td>
<td>(33)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>64</td>
<td>107</td>
</tr>
</tbody>
</table>

$x^2 = 15.57; d.f = 1; P$ lies beyond .001.

major was associated with lack of academic success since $x^2$ was 15.57. $P$ lies beyond the .001 level of significance.

The same group of men less the students who did not return for the third and fourth semesters were the subjects in the second phase of this study. Again the null hypothesis
Lack of academic success and change of major are not associated in college students. As shown in Table IV, the group was composed of 70 juniors who had completed four semesters of work in engineering and physics and were registered for their fifth semester. The successful group amounted to 36 students, and the unsuccessful group to 34. Only 7 of the successful group had changed major while 29 had not changed major. Twenty-eight of the students in the non-successful group changed major, while only six did not change major.

When \( x^2 \) was calculated to test the independence of these two variables, it was found that \( x^2 \) was 27.68. The

\[
\begin{array}{|c|cc|c|}
\hline
\text{Group} & \text{Changed Major} & \text{Did Not Change Major} & \text{Total} \\
\hline
\text{Successful} & a. 7 \quad (18) & b. 29 \quad (18) & 36 \\
\text{Not successful} & c. 28 \quad (17) & d. 6 \quad (17) & 34 \\
\hline
\text{Total} & 35 & 35 & 70 \\
\hline
\end{array}
\]

\( *x^2 = 27.68; \text{ d.f.} = 1; P \text{ lies beyond .001.} \)
A second purpose of this study was to test the hypothesis that students who change major have lower mental ability as indicated by total raw scores on the American Council on Education Psychological Examination, 1954 College Edition, than students who did not change major. The subjects of this study were 232 students composed of both men and women in the second and third year of college who were selected at random from the student body and who represented most of the major areas of study. These students had been tested at the time of their entrance as freshmen. The means and standard deviations for both groups were calculated as were the standard error of the difference between the means and t. The results of the calculations are shown in Table V, which shows that t was insignificant since the means are almost identical. Since no difference was found between the two groups, it was assumed that in such a heterogeneous
TABLE V

RELATIONSHIP OF MENTAL ABILITY AND CHANGE OF MAJOR
IN COLLEGE STUDENTS*

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Mean</th>
<th>σ</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changed major</td>
<td>114</td>
<td>92.18</td>
<td>22.04</td>
<td>2.07</td>
</tr>
<tr>
<td>Did not change</td>
<td>118</td>
<td>92.51</td>
<td>21.04</td>
<td>1.94</td>
</tr>
</tbody>
</table>

*t = .14; P lies at .8 level.

Group mental ability was not shown to be related to change of major.

A second study was conducted in such a way as to control the influence of subject matter. To control this variable more closely, a second sample was used which was composed of students who were majoring in physics and engineering. All students in these majors are required to take courses in higher mathematics and the physical sciences such as physics and chemistry courses, which are thought to require a rather constant amount of mental ability for success. The result of calculating the standard error of the difference between the means of the two groups is presented in Table VI. It was found that t was significant beyond the .001 level of significance. The null hypothesis was rejected. Mental ability was related to change of major.
Those students who changed major had lower mental ability scores than did those who did not change major when the factor of subject matter was held relatively constant.

The Relationship of Change of Major to Change of Interest

To test the hypothesis that students who change major show greater tendency to change interest than students who do not change major, the Kuder Preference Record Form BB was readministered to sophomore and junior level students who had taken it previously as entering freshmen. The differences between their test-retest scores were obtained. For each of the groups the mean change on each of the nine Kuder scales was determined and these were compared to establish the level of significance of their difference. The results of these comparisons for a heterogeneous group of 303 students is shown in Table VII. The 157 students who
TABLE VII
CHANGE OF INTEREST FOR STUDENTS OF HETEROGENEOUS MAJORS
WHO DID AND DID NOT CHANGE MAJOR

<table>
<thead>
<tr>
<th>Scales</th>
<th>Did Change N = 146</th>
<th>Did Not Change N = 157</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mo</td>
<td>t</td>
</tr>
<tr>
<td>Mechanical</td>
<td>-1.6369*</td>
<td>1.2987</td>
</tr>
<tr>
<td>Computational</td>
<td>-2.3767</td>
<td>2.45</td>
</tr>
<tr>
<td>Scientific</td>
<td>-4.3972</td>
<td>3.2332</td>
</tr>
<tr>
<td>Persuasive</td>
<td>4.5890</td>
<td>2.7981</td>
</tr>
<tr>
<td>Artistic</td>
<td>1.0821</td>
<td>.77</td>
</tr>
<tr>
<td>Literary</td>
<td>1.4109</td>
<td>1.21</td>
</tr>
<tr>
<td>Music</td>
<td>.8767</td>
<td>1.2176</td>
</tr>
<tr>
<td>Social Service</td>
<td>9.5890</td>
<td>6.392</td>
</tr>
<tr>
<td>Clerical</td>
<td>.3767</td>
<td>.32</td>
</tr>
</tbody>
</table>

*Changes that represent a loss of interest are preceded by a minus sign.

did not change major showed a gain in social service interest that was significant at the .001 level. They showed a loss in clerical interest that was significant at the .01 level and a loss in musical interest that was significant at the .02 level.

The 146 students who changed major showed a gain in social service interest that was significant at the .001
level. They also showed a gain in persuasive interest and a loss in scientific interest that were each significant at the .01 level. They showed a loss in scientific interest that was significant at the .02 level. The conclusion was that students who changed major produced more changes of interest than students who did not change major.

Even though this study showed, by the greater number of significant changes, that students who changed major showed greater tendency to change interest than students who did not change major, the fact that this was a large heterogeneous group might have caused all except the most general trends to cancel each other. As a result an identical procedure was used to study the change of interest associated with change of major in a more homogeneous group of students.

The subjects for this study were 72 male students majoring in physics and engineering. They were considered to be homogeneous because they all were required to pass the same basic subjects in mathematics and science. The results of this study are presented in Table VIII. The 34 students from the group that did not change major showed no significant change of interest on any of the scales. The 38 who changed major showed loss of interest in mechanical, computational, and scientific scales. The loss in mechanical was beyond the .02 level, while the losses in the computational and scientific scales were beyond the .001 level.
TABLE VIII

CHANGE OF INTEREST FOR STUDENTS OF HOMOGENEOUS MAJORS
WHO DID AND DID NOT CHANGE MAJOR

<table>
<thead>
<tr>
<th>Scales</th>
<th>Did Change $N = 38$</th>
<th>Did Not Change $N = 34$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M_c$</td>
<td>$t$</td>
</tr>
<tr>
<td>Mechanical</td>
<td>5.6053</td>
<td>2.67</td>
</tr>
<tr>
<td>Computational</td>
<td>-10.2631</td>
<td>6.71</td>
</tr>
<tr>
<td>Scientific</td>
<td>-16.1579</td>
<td>6.04</td>
</tr>
<tr>
<td>Persuasive</td>
<td>13.6842</td>
<td>4.07</td>
</tr>
<tr>
<td>Artistic</td>
<td>2.0526</td>
<td>.933</td>
</tr>
<tr>
<td>Literary</td>
<td>3.3157</td>
<td>1.3424</td>
</tr>
<tr>
<td>Music</td>
<td>1.2368</td>
<td>1.17</td>
</tr>
<tr>
<td>Social Service</td>
<td>9.8684</td>
<td>4.04</td>
</tr>
<tr>
<td>Clerical</td>
<td>3.0789</td>
<td>1.17</td>
</tr>
</tbody>
</table>

*Changes that represent a loss of interest are preceded by a minus sign.

The conclusion was that in a homogeneous group of college students those who changed major showed a greater tendency to change interest when compared to those who did not change major.
Summary and Discussion

The results of the studies of the relationship of success to change of major indicated that students who were not successful showed a stronger tendency to change major than students who were successful. Where the group was heterogeneous in its make-up, 60 per cent of the students who were unsuccessful changed major.

Where homogeneous groups were formed by taking only students whose majors required them to pass difficult subjects such as mathematics and physics, only 58 per cent of the unsuccessful students changed major by the time they registered for their third semester. When they had completed two years, 82 per cent of those who were unsuccessful had changed major.

Some of these students stated that their counselors had suggested they should change major. Fifteen per cent of the students from the heterogeneous group that changed major indicated they had been advised by their counselor to change.

In the study of the relationship of mental ability to change of major no difference was found between the students who changed major and those who did not change major for a heterogeneous group of students. Where a homogeneous group, composed of students of engineering and physics majors, was studied the difference in mental ability of the two groups was significant at beyond the .001 level. Those
students who changed major had lower mental ability scores than the students who did not change major.

Where the relationship of change of major to change of interest was studied two groups were used. In the heterogeneous group those who changed major showed more tendency to change interest than those who did not change major. In the homogeneous group, made up of engineering and physics majors, those students who did not change major showed no significant change of inventoried interest. Those who changed major changed significantly on five scales. They produced lower scores on the Mechanical, Computational, and Scientific scales and higher scores on Persuasive and Social Service scales. They lost interest in types of work related to their first major and gained interest in helping people and influencing people.
CHAPTER IV

A STUDY OF INTERVIEWS WITH STUDENTS WHO WERE CHANGING MAJOR

The earlier portions of this study were concerned with those factors related to change of major which might be common to all students. It was intended that they would reveal information related to change of major by students generally.

The purposes of this portion of the study were two-fold. First, it was intended to give more holistic information about the individual's own conception of the situation pertaining to his change of major. This might or might not be at variance with the facts.

Second, it was intended to illuminate in detail the situation surrounding individuals at the time they were changing major to determine if some students have in addition personal and peculiar reasons for change of major. These facts would be of such nature that they might yield pertinent, detailed information that would explain and possibly verify the findings of the quantitative studies; yet they would have their source in the particular
constellation of circumstances surrounding the individual who experienced them.

The procedure was to conduct interviews with individuals during which they would discuss their change of major and the reason or reasons for doing so. The subjects were told the purpose of the recordings and, although there was no intention of using names or personal references, their permission was obtained to use the material. Only those portions of the material were used that had direct relationship to the purpose of the study.

In an interview with a sophomore girl, she explained the reasons for her change of major in the following manner:

I came to college with my mind already made up to major in journalism. It had been the type of work I had learned to enjoy in high school; however, my class schedule did not include any journalism courses the first year, and I lost all contact with that department and met no people in the same field as I had in high school.

My new friends and classmates became more important to me than that distant high school goal. I am changing my major to be with my new friends and to fit my new interests and goals.

In fifteen months there had been a rather remarkable change in her interest test score. At the time of entrance her high interest areas expressed in percentiles were Mechanics 86, Scientific 71, Literary 91, and Musical 88. Fifteen months later Mechanical had changed to 94, Computational had changed from 60 to 74, Scientific changed from
71 to 94, Literary had changed from 91 to 20, Music changed from 88 to 30, and she had lost interest also in Social Service and Clerical, interest areas in which her scores were already low.

She was a very successful student in mathematics and science and changed major to secondary education with plans to major in either mathematics or science for a teaching subject. Her score on the American Council on Education Psychological Examination for college freshmen indicated she had ability for college work exceeded by only one fourth of college students.

In this case friendship and acceptance on the part of science students was an important reason for change of major and possibly change of interest; however, it seemed reasonable also to assume that success in science and mathematics might have had the effect of increasing her interest in that area. There can be no doubt that her interest scores had changed remarkably.

A young man who had entered college to study engineering but was changing to business administration explained the reasons for his change in the following manner:

I started in engineering because I was interested in mathematics. There had been a lot of stress on it in high school, and since I had always been good at it, I decided to follow my teacher's suggestion and try engineering. I really didn't have any careful counseling but was following my teacher who had majored in engineering. I took engineering drawing in high school...
and did well; I thought there were good jobs available in that field so I just decided to go that way.

When asked why he was changing, he replied,

I can't help but see engineering as one laboratory after another, and they are all boring to me. I wasn't having a hard time in any area, wasn't down--yes, I made a C in chemistry--but mainly I just didn't like being a test-tube watcher. I turned to business because I wanted to be somebody and work with people. I guess it might be a hangover from those days when I played my trumpet and got people's attention and approval. I wanted to move downtown and be somebody, and business seemed to offer me the best chance to do it. I want to dress up and be somebody that people look up to.

He backed up his statements with choices on The Questionnaire on Persistence of Choice of Major such as, "I found I had developed new interests in different kinds of work since I started college. I found the class work involved was dull and uninteresting. I wanted a vocation that would give me more prestige. I didn't have the aptitudes for that major, and I thought I could make better grades in courses pertaining to my new major." These last two might be related to the fact that although he was not failing, he was not as successful in mathematics and science as he felt he should be and that lack of success might have been more important as a factor in his decision to change major than he was willing to admit.

Changes in his interest test scores had already taken place. His percentile rank in Scientific changed from 41 to 2. His Persuasive score, from 51 changed to 85, and Clerical changed from 78 to 97. Computational, which had been 68, had changed to 140. Artistic changed only slightly from
62 to 91, Musical from 86 to 78, and Social Service from 10 to 30. He seemed to be showing a trend away from science, mathematics, and music and a trend toward people, selling, and clerical work.

In the case of this young man, the predominant factor would appear to be interest; not so much change of interest but actually changing from a major which he chose without having a real interest in the subject matter involved. The influence of his teacher was also an important factor in causing him to choose engineering although he was not interested in that kind of work. He chose a major more in keeping with his interests.

One young man with ability in the lowest one fourth of college students as indicated by the American Council on Education Psychological Examination for college freshmen and who also had a grade-point average of 1.10 changed major from chemistry to physical education. On The Questionnaire on Persistence of Choice of Major, he indicated that he had developed new interests in different kinds of work since he started college, that mathematics was somewhat of a barrier to him, that he was looking for a job that would give him more prestige than chemistry, and that he felt he could make better grades in his new major than in his previous one. In his interview he was very brief in his statement about his
reason for changing major. When he was asked if he would care to say why he changed major, he replied:

Yes, after one year I knew I was in the wrong field. I didn't like mathematics or science, and chemistry required a lot of both of them. I have always liked children and I like coaching; so I changed to physical education, and I think I'll like it much better.

I don't know how I got started in chemistry, anyhow; I guess I had just heard a lot about it, and when Dad suggested it, too, I went along, but no more! I've had all of that I want. I'd rather work with people.

He changed to physical education, which was appropriate for his interests at that time. His interest score in Scientific at the time of entrance was 4; it changed to 17. His score in Computational changed from 59 to 16. His Social Service score changed from 25 to 70.

His decision in choosing a major would appear to have been an impulsive one affected by his father and not in keeping with his interests or abilities. When he changed major after not being successful in his first choice, he accepted counseling and chose a major in which he had interests as well as sufficient ability.

A very capable sophomore girl, whose total score on the American Council of Education Psychological Examination for college freshmen had a percentile rank of 98, changed from chemistry to English because, she said:
I would have had to take make-up non-credit courses in mathematics in order to go on in chemistry. That and the long laboratories four afternoons a week was more than I cared for.

There were other reasons, too. My freshman English teacher was very interesting and aroused my interest in that subject, while a not too stimulating chemistry teacher stifled my interest in that subject; so the upshot of it all was I'm going to major in English, and so far I like it very much.

Other than a change in percentile rank from 53 to 94 in literary, there were few remarkable changes in her interest scores. Persuasive changed from 82 to 42, and Scientific changed from 27 to 17. The other scales remained practically unchanged and low except Musical, which remained high and unchanged. Computational interest changed from 25 to 19.

On the questionnaire she indicated that mathematics was somewhat of a barrier to her and that she thought that she could make better grades in her new major. It was most interesting to note that her interview followed her answers on the questionnaire very closely, and she seemed very frank in both of them.

Another very capable sophomore boy, who was changing from engineering to business, started the interview by saying:

I feel somewhat confused right now. I was always going to be an engineer, and I did well enough last year, but now I don't seem to be getting the grades somehow. It wasn't that I felt I wanted to do engineering particularly but it was something I felt I could do. I always made good grades in mathematics in high school, but now I am just getting by, and I find I don't like
mathematics and am not working at it. I feel I would do better going into business. I think I want to take that combination course of business with a major in insurance and, at the same time be able to go into law if I want to and eventually get a degree in both. Then I would be prepared either way.

The changes in his interest test scores for the fifteen-month period were rather great. Mechanics changed from 98 to 60; Computational from 74 to 16; Scientific from 99 to 57; Persuasive from 36 to 85; Artistic from 74 to 37; Social Service from 5 to 66; and Clerical from 51 to 20. There was a remarkable loss in all areas pertaining to engineering and heavy gains in Persuasive and Social Service.

When it was pointed out to him that business included both clerical and computational work and that he did not seem to show much interest in either, he replied:

I am planning to go into the field of business where I will work with people and do work more like talking and selling than accounting and stuff like that. I think I have had all the work with figures that I want for a while.

The expected low grade in mathematics seemed to be an important factor in his decision to leave engineering and seek another major. Even though he was not sure of what he really wanted, he was very certain of that which he wished to avoid. His feeling that he was not doing at all well in mathematics was a primary reason for change of major and interest.
Failure to be able to achieve a high enough speed in shorthand was given by a junior girl as her reason for leaving the major of secretarial science. Her approach to the problem was very direct and honest. She brought up the subject of change of major with the statement:

I have to change major, and I wonder if my tests indicate that elementary education would be a good major for me.

The counselor replied, "You have to change your major and you would like to know if elementary education was a good second choice?"

She said: Yes, I simply could not make the speed in shorthand; so I have to choose a new major. I have been working in the education office. I think I would like elementary education because I like children and I like teaching.

She had been in college five semesters, and her interest in Computational had changed from 85 to 87, and her interest in Clerical had changed from 99 to 98. Persuasive had changed from 95 to 82, and Social Service had changed from 30 to 81. The only important change in her interests was in Social Service.

Her answer to the questionnaire followed the interview very closely. Indicating that although she was still interested in secretarial science she could not complete the major, so as a second choice, she was going to take up elementary teaching which was an area in which she had developed a new interest since she had been in college. Since
she had already taken several courses in education, she knew much of the nature of teaching. Education seemed to please her nearly as well as secretarial science, but she obviously was mildly disturbed by being forced to change major on account of failure.

A young man in his third year of college was discussing his problems in connection with his change of major. He was a rather self-sufficient young man who had done much to earn what he needed in the way of expenses in college, yet had received substantial assistance from persons in his church at home who felt he would benefit from a college education. In his own words he gave a rather clear picture of what he went through:

I am majoring now in education with a teaching subject in biology and maybe in chemistry.

When I started to school I really didn't know what I wanted to do but I felt it would be good to get a college education if I could. I had been active in my church and in school. Friends at home offered to help me with gifts of cash for tuition and expenses, and my minister helped me by requesting and getting me a Religious Service Scholarship. That pays about half my tuition each semester. These were of great help to me but made me feel obligated to choose a major in religion and to not change it.

All this time I worked all the time I could and saved all I could, but I couldn't help feeling that I was in the wrong major. I was never sure that I wanted to be a minister, and when I took my first course in biology I found I was very much interested in it. Then I took my second course and knew that I wanted to study biology and maybe teach it some time. Still I didn't feel right about going on with a scholarship intended for those preparing for the ministry
when I wanted to do something else; so I did two things at the same time. I talked over my desire to change to teaching with my friends in the church. They said they understood and would still help me all they could. I also made application to the university scholarship committee for an academic scholarship to replace my religious service scholarship and was successful in getting it.

Now if I can only complete a degree in education with majors in biology and chemistry, I should be able to do what I really want to do.

His interest test scores reflected his developed interest in biology and chemistry and the required mathematics. Mechanical changed in percentile rank from 15 to 35, Computational from 45 to 83, Scientific from 56 to 96, Persuasive from 51 to 15, Artistic from 69 to 06, Literary from 59 to 37, Musical from 83 to 66, Social Service from 73 to 96, and Clerical from 54 to 29.

His answers on the questionnaire also reflected this change. He indicated he had developed new interest in different kinds of work since he entered college. He had found his previous class work dull and uninteresting; he said that his original choice of major was not entirely his in the first place. He also indicated that he felt it would take too long (four more years) to complete his old major, and the new major offered him more security. He further said he did not like the type of life led by people in that vocation and that he did not feel comfortable doing what was required in that job.
Everything considered, he seemed to have developed a very definite interest in the general fields of science and working with people and seemed to be able to give a very logical account of how the change had come about.

A more brief, but nonetheless clear, explanation of why he changed major was given by a rather mature man who was working as he went to school. He had started to major in advertising in business and had completed two years of that work. Late in his third year he changed to journalism. None of his interest areas changed significantly during his three years in college. His explanation was:

My time for study is very limited. I have to do the best I can with the time I can devote to school. I would have to take accounting to complete my degree in advertising, and it would have been such a drain on my time that my courses in my major would have suffered or else I would have failed accounting. I didn't feel the course was that important to me; so I changed major to miss the course.

Another factor in this was that I didn't know the exact course content of some of these classes. If I had known more about the courses when I first enrolled, I probably would have picked journalism as my major in the first place.

His answers on the questionnaire were as direct as his explanation of his change. The only reasons he checked for changing major were "Mathematics was somewhat of a barrier to me" and "I thought I could make better grades in courses pertaining to my new major."
He seemed to show a lack of occupational information regarding the vocations related to business. His situation was also complicated by the fact that he had to earn a living for himself and his family. In his case his interests did not change; he simply changed major to avoid certain subjects, yet chose a major suitable to his interests.

One student who changed from a major in chemistry to secondary education with the teaching subject of history made the following statement:

I changed my major at the end of my third semester from chemistry and biology to history and education because my interests were beginning to change after a year in biology where I got D's and chemistry, which I failed. Also, I figured I had rather be a parent than anything else, and education would be a good thing to fall back on.

In her answers on the questionnaire, she gave as her reasons for changing major, unwillingness to make the sacrifices needed to complete the major, lack of aptitudes for the major, mathematics was a barrier to her, she felt she could make better grades in her new major, job security in later years, admiration for teachers in the area of her new major, and dislike for teachers in the first major area.

Her interest scores changed from a percentile rank of 92 to 45 in Mechanics, from 82 to 70 in Science, from 41 to 55 in Persuasive, from 76 to 66 in Artistic, from 26 to 60 in Literary, and from 15 to 71 in Social Service. The other areas were low and showed no change.
The loss of interest in Science and the gain in interest in Literary might be directly traceable to her experience since she has been in college. Failure in Science was associated with loss of interest in science. Her record indicated unsatisfactory progress but a C average in English and one C and one B in history. She took for her new major the area of her greatest success.

One young married woman gave as her reason for changing major a rather complicated series of circumstances. Her previous major had been speech-drama-radio, a major she had liked very much. However, at the end of the school year her husband was to be transferred to another city. The only college that would afford her an opportunity to complete a degree did not have a major in the area of her previous major. As a result she changed her major to secondary education with a teaching subject in English. She said she still preferred speech-drama-radio but felt she had to change major to avoid possible loss of credit because specialized courses might not count as credit toward graduation.

She was making satisfactory grades, and there were no appreciable changes in her interest test scores. This one reason seemed to be her only one for change of major.

In discussing his reasons for change of major, a young man who had been planning to enter dental school and was changing to business administration, said:
Since the death of my father last year, leaving Fort Worth to go to dental school is impossible. I changed to business because I already have a part-time job with a good company, and I think I would be wise to keep it and plan my education so that it would help me to advance in the concern.

However, inspection of his record left the impression that his progress in his studies had been only fair, and he showed considerable loss of interest in Science with a gain in Persuasive. It seemed that lack of success was also a contributing factor in this change.

A student who had changed from a major in geology to psychology gave the following as his explanation:

When I came to the University, I thought geology was the answer to my vocational problem, but when I got here and joined a fraternity, I learned that I liked to work with people; now I want to be a psychologist. I thoroughly enjoy helping people and feel that I am completely satisfied with my choice.

He explained that he had been elected captain of his pledge group and had taken a very active part in leading them and helping them develop. After initiation he was made official pledge trainer for his fraternity and was very successful with his work. One of their projects, of which he was very proud, was helping some children from an orphans' home. He felt this also increased his desire to help people.

His interest profile was very interesting in that the percentile rank of his Social Service score changed from 01 to 94. He lost interest in Mechanical, Computational, Scientific, Music and Literary but gained in Persuasive, Clerical, and Social Service. Although he had taken
mathematics in high school, he avoided it during his freshman year in college. He indicated above-average ability and had made grades that were better than a C average. The conclusion seems to be unavoidable that his interests dominated his reasons for change of major and that his interests were considerably influenced by his experience in college.

Summary

Interviews were conducted with individual students for two purposes. The first was to obtain more holistic information regarding the individual's own conception of the situation pertaining to his change of major. The second was to determine if some students had personal and peculiar reasons for change of major.

Personal interviews had the effect of verifying the reasons for change of major indicated by the quantitative studies.

Some students stated they changed major because of some factor they considered important and unavoidable. This reason was frequently the only obvious one for change. This type of situation occurred very infrequently and the reason given was usually quite unique in nature.

Some students gave reasons for change of major that seemed very sound and obvious but when their records were examined lack of success also was found as a probable cause.
Lack of occupational information and unfamiliarity with academic requirements were given as reasons for change of major.

Several students stated they had changed major in order to be able to study in an area more in keeping with their original interest. They changed major to be able to study subject matter compatible with their previously established interests. In effect this amounted to discovering how to follow interests already present.
CHAPTER V

STUDENT REACTIONS TO THE QUESTIONNAIRE
ON PERSISTENCE OF CHOICE OF MAJOR

The purpose of the questionnaires was to gain information on why students did or did not change major. This was accomplished by giving students an opportunity to respond to twenty-five questions relative to change of major. The content of these questions was obtained from statements of students from three different colleges who had been asked to list their reasons for having changed major. Copies of the two forms of the questionnaire will be found in the Appendix.

For students who did not change major a response indicated that as far as the idea embodied in that statement was concerned, they had experienced no change in attitude, and it was not a reason for them to leave their major. For students who had changed major a response indicated that a change had taken place in their attitude toward the idea or that it was a reason for them to change major.

The responses made to the questionnaires by each group of students are summarized in Table IX. This table shows the total number of students in each group who filled out
### TABLE IX
SUMMARY OF QUESTIONNAIRE

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the questionnaire and the number who responded positively to each question. It also shows the percentage of the group that number represented. These results will be discussed question by question with a view of obtaining as much information as possible from both group and individual reactions to the questions. Additional material was introduced from the remarks added to the questionnaire by the respondents.

The first statement was presented to the group that had not changed major in the form, "I find that I am interested in the same kinds of work as when I started college." It was presented to the group who had changed major in the form, "I found I had developed new interest in different kinds of work since I started college." Ninety-three per cent of the group that did not change major responded in such a manner as to indicate that their interests had not changed, and 69 per cent of the group that changed major indicated they had developed new interests in different kinds of work since they had started college. This was the most frequent reason given for change of major.

There was almost no difference in the way the two sexes responded to this question. Since 31 per cent of the group that changed major indicated their interests had not changed, an inspection of the individual responses and the records of the students was made to determine whether or not this was a result of carelessness or misunderstanding.
or whether there really had not been a change in interest. The answer seemed to be readily evident in most cases. Either they had changed to a similar major where interest areas were similar so no change in interest was called for, or they had changed to another major that was in some ways dissimilar but was nevertheless suitable to their interests. This might be illustrated by the case of the young man who started out to be a geologist but changed in his junior year to teacher, secondary education, with a view of teaching science in high school. In his case a high social service interest was present in his interest pattern at the time of entrance. A few students who felt forced to change major did so without an immediate change in interest being evident. In general, most of the students seemed to respond to this statement with relevant and meaningful frankness.

The second statement was presented to the group that did not change major in the form of "The class work in my major is pleasant and interesting." Eighty-eight per cent of the group agreed that it was. It was presented to the group that changed major in the form of "I found that class work involved was dull and uninteresting." Twenty-four per cent of this group agreed that it was. Although there seems to be an obvious relationship between the way the members of the group that did not change major responded to the first two statements, the manner in which the group
that changed major responded to these two statements in-
dicates that either the statements do not have exactly
opposite meanings or that another process is in operation
in the second group except their reaction to the class work.
If the term "interests" does not apply to the actual class-
room study of the subject, it may have a more general mean-
ing and may refer to whether or not that major represents
a suitable vocation for the respondent rather than being
intrinsically interesting.

Since poor reading ability is frequently listed as a
factor in success in college, the statement, "I can com-
fortably accomplish the required reading," was presented to
the group that did not change major, and the statement, "It
required more reading than I cared to do," was presented
to the group that had changed major. Eighty-eight per cent
of the group that did not change major indicated that read-
ing was not a problem for them. Only 3 per cent of the
group that changed major said their previous major required
more reading than they cared to do. From this we might con-
clude that either the question failed to get the desired
response or that reading is not recognized as a factor
frequently associated with change of major in college
students.

The influence of the presence or absence of members of
the opposite sex on persistence of choice of major was pre-
sented to the group that did not change major in the form
of "Absence of members of the opposite sex did not detract from the attractiveness of this major." Sixty-six per cent of the group agreed that it did not. It was presented to the group that changed major in the form of "There were too few members of the opposite sex studying this major." Only 1 per cent of the group that changed major listed this as a reason for change. Evidently in a coeducational college this is not a factor associated with change of major. From the responses of students who did not change major, it may, however, be a prominent factor in the satisfaction which they derive from the major. There was no difference in the way in which the sexes responded to this statement.

The statement, "I am willing to make the sacrifice needed to complete this major," was responded to positively by 85 per cent of the group that did not change major. It was presented to the group that changed major in the form of "To complete the major would require more sacrifice than I was willing to make." Twenty-two per cent of this group responded positively. Reactions to this statement were intended to reflect whether or not financial problems, extended years of study at another school, or similar factors caused the student to feel that the sacrifice called for was too great to continue the study. In about 10 per cent of the cases, these factors were associated with this response; however, it seemed that in the majority of cases it was associated with
lack of desire to work hard at course material so difficult that good grades seemed to be nearly impossible; so in many cases the sacrifice was one of feeling, not of material or financial nature.

An illustration of this might be found in the case of the girl who changed from medical technician to religious education. She had indicated that her interests had changed and that she had found the class work dull and uninteresting. She also indicated that she thought she could make better grades in religious education. In a note on the questionnaire, she indicated that she was not getting much out of her former major because the terms were difficult to understand since they were of a very technical nature. She also said that she had spent some time working with children and enjoyed the experience and as a result had decided to change major in order that she would be prepared to work with children.

Her total scores on the American Council of Education Psychological Examination ranked her at the thirtieth percentile; since other research has indicated that above average scores are required for success in that major in the school she was attending, it seems logical to conclude that she felt the sacrifice she was not willing to make was a personal one and of an affective nature, not a material one.

Another girl, who said that to complete her previous major would require more sacrifice than she was willing to
make, also said mathematics was a barrier to her and that she did not have the aptitude for the major. She also said she thought she could make better grades in courses pertaining to her new major. In part of her interview she said:

I changed major from the field of biology and science to history and education because my interest was beginning to wander after a year in chemistry, which I failed, and a year in a major in which I acquired only grades of D. I also felt that education would be a good major to fall back on after I was married and a parent.

Again, her sacrifice seems to be one of unrewarded effort and fear of failing. There was no mention of material or temporal sacrifice.

Two young men who changed from the study of preliminary medicine to secondary education each indicated they had experienced a change of interest, that mathematics was a barrier, that changing schools to complete the study was a reason, and that they could make better grades in their new major. It seems safe to assume that the sacrifice which they had in mind might have been a material and financial one as well as a personal one.

Many of the students who had not changed major evaded answering the question, "Mathematics is not a barrier to me." Although only 39 per cent of the group stated it was not a barrier to them, a number of these indicated in personal interviews that it was not a barrier because they chose a major where it was not required. Students who
changed major were asked to respond to the statement, "Mathematics is somewhat of a barrier to me." Twenty-eight per cent replied that it was. Frequently students who were getting along quite well in other areas were unable to do the mathematics involved. From inspection of individual records, calculus seemed to be the course that eliminated most of those that survived the first full year of study in the sciences, although some with poor background and poor ability were eliminated by the earliest courses in college algebra. It seems safe to venture that mathematics influences not only the choice of major in college but also is very frequently influential in causing students to change major.

Since a number of students had indicated that a rather indefinite factor similar to prestige or social acceptance was a reason for their decision to change major, a statement was included in an attempt to sample their feelings in this regard. It was presented to the group that did not change major in the form of "I like the prestige associated with my major." Seventy-six per cent of the group responded positively. There was little difference between the ways in which the two sexes from this group responded.

It was presented to the group that changed major in the form of "I wanted a vocation that would give me more prestige." Sixteen per cent listed this as a reason for
change. An interesting aspect of this problem seemed to be related to the maturity of the student; younger students tended to look at the prestige value fellow students placed on the major, but older students seemed to look at it from the long-range, after-graduation point of view.

The eighth statement, which was presented to the group that did not change major as "I want to do work where I can help people" was presented to the group who changed major in the form of "It (my old major) did not offer sufficient opportunity to help people." Seventy-nine per cent of the group that did not change major indicated they wanted to help people. Twenty-four per cent of the group who changed major listed it as a reason for change.

One young man listed reasons for change from engineering to education in order. First on his list was "Desire to help young people get started off right without wasting several years." Second he listed "Apparent native ability in this field"; third, "More satisfying job"; and fourth, "Interest in education." He did not mark the questionnaire to indicate that his interest had changed. Social service interest was high and remained unchanged on his retest. Mechanical and computational interests remained high and unchanged; there was a slight decrease in interest in science and an increase in literary interest, but there was in general very little change in two and one-half years.
One girl added a note to her questionnaire to the effect, *I wanted to be prepared to teach as I'd rather work with people than with a typewriter.*

Students seemed to approach the problem of helping people from several angles; usually they sought to accomplish it by changing from a field where there was an emphasis on an art or science or a skill such as mathematics, to a field in which there was greater opportunity for an interpersonal reaction such as education, business, or religious education.

The problem of foreign language being a barrier was presented to the group that did not change major in the form of "I can handle the required foreign language." It was presented to the group that changed major in the form of "I found the required foreign language too difficult." Since such a large number of the group that did not change major avoided a yes or no answer by checking the "Does Not Apply" column, it did not serve as a completely useful question to apply to this group. Twenty-nine per cent of the group indicated that foreign language was no problem to them, but the meaning must be considered doubtful. Five per cent of the group that changed major indicated that foreign language was too difficult for them and listed it as a reason for change of major. This five per cent was made up of eight males and one female, which would indicate that learning a foreign language probably is a real factor.
for some people and more of a problem for men than for women.

Since aptitude is a term that has a somewhat ambiguous meaning to most people, yet is generally interpreted as being at least closely related to ability, a stimulus statement which would reflect the student's idea of the suitability of his aptitude was felt to be a desirable indicator of his concept of the suitability of his ability to do the work of his major. This assumption was also indicated in the statements of students as a reason for their change of major. The idea was presented to the students who did not change major in the form of "My aptitudes seem suited to this major." It was presented to the group that changed major in the form of "I didn't have the aptitudes for that major." Ninety per cent of the group that did not change major indicated they thought their aptitudes were suited to their major. Twenty-nine per cent of the group that changed major said they felt they did not have the aptitudes for the major they left. While this is obviously an admission on the part of a large portion of the group that changed major that they did not have the ability to do well in the major, it will be noted in the discussion of their reactions to statement number twenty-five that a considerably larger number were more willing to say they could make better grades in their new major than would indicate they were not able to be successful in their previous major.
In counseling it is frequently mentioned that it is not wholly wise for parents and others to choose a major for the student, that it would be more suitable for his choice to develop out of his experiences and as a result of his tentatively approaching various vocations to see if course work, subject matter, or active participation in the vocation were suited to his needs, interests, and abilities. Many counselors have been suspicious of choices forced on students by parents or others. As a result, when this statement appeared in the list of reasons given by students for change of major, it was included in the questionnaire and was presented to the students who did not change major in the form of "I chose this major; no one chose it for me." Ninety-seven per cent of that group agreed that they had chosen their major for themselves.

It was presented to the group that changed major in the form of, "The choice of my original major was not entirely mine in the first place." Thirty-four per cent of that group indicated that someone else had at least helped them choose their original major. Several students indicated spontaneously by emphasis of double checks in this space that they felt someone else had exerted undue influence on their choice. In evaluating the responses of these two groups to this question, it seems that the difference between the responses of the two groups is too great
to be realistic. It is hard to believe that one group is almost unanimous in that they alone chose their major while one third of another, probably less successful, group maintain that they did not have sole responsibility for the choice of their major in the first place. It would be interesting to know if this is not a rationalization by which they might have sought to place the blame for their apparent failure on someone else while the group that did not change major were as anxious to take the credit for a job well done or actually felt their choice was really their own.

In the case of the student whose plan of life is altered by unforeseen events, attending college more than the traditional four years might be more than he felt he could afford in time. This idea was presented to the group that did not change major as, "I felt I had sufficient time to complete the study." It was presented to the group that changed major as, "I felt it would take too long to complete the study." Eighty-eight per cent of the group that did not change major said that they had sufficient time to complete their major.

Eighteen per cent of the group that changed major listed length of time to complete the study as a reason for change. In most cases for both men and women they were changing from a major requiring advanced professional
training to one requiring only four years. A few changed from a difficult major requiring four years to graduate to one thought to be less difficult. This might indicate that they had anticipated scholastic difficulty if they had not changed or that they would be forced to take a reduced load in order to allow sufficient time for study, which would in turn make it necessary that they spend more than the usual eight semesters in college.

An illustrative response could be taken from the report of one student, who said:

I discovered that an architecture course could not be completed in less than five years, and I couldn't afford to spend that much time in college.

He also indicated that to complete the course would require more sacrifice than he was willing to make and that his interests had changed since he started college. He changed to a major in business.

Students who had become established at a school frequently indicated that they disliked the prospect of changing schools to complete their major. This idea was embodied in the statement presented to those who did not change major in the form of "It would not bother me to have to change school in order to complete my study." Only fifty-five percent of the group said that it would not. It was presented to the group that changed major in the form of "Because to complete my study, I would have had to change schools."
Only 10 per cent of this group gave it as a reason for change. This would indicate that many students find it difficult to continue the pursuit of majors that require them to leave the school where they started their education. It would seem to be another indicator of the value of a more general course for at least the first year so that the student would have a longer period of time to consider all the factors associated with the choice of his major.

The effect of the attractiveness of teachers was presented to the group that did not change major in the form of "Interesting teachers in other areas have not changed my interest in my major." Eighty-two per cent indicated this was true. It was presented to the group that changed major in the form of "I admired a teacher in the area to which I changed." Twenty per cent of the group indicated they had been influenced in this way. Students mentioned this several times as the specific reason for their change of major. One student said,

The only reason I changed major was because I liked the way a teacher in that area taught.

Another student said,

A very excellent freshman English teacher aroused my interest in that subject as a major, whereas a not too stimulating chemistry teacher stilled my interest in that subject.

This particular student also checked twelve other factors as further reasons for change of major. They
involved either the interesting nature of the major or ability to succeed in the course, primarily. Her test scores indicated a change in the direction of greater interest in literary work and lower scores in computational and scientific interest. Students' answers indicate that they are influenced to change major by their liking for specific teachers.

Many students, particularly girls, seemed to want a job they could always go back to for job security in later years. This idea was presented to the group that did not change major in the form of "My major offers me job security if I need it in future years." Eighty-seven per cent of that group indicated they felt that was true of their major. It was presented to the group that had changed major in the form of "The new major offers more job security if I should need it in later years." Forty-five per cent seemed to feel they had improved their chances for job security in later years by changing major.

There was a distinct difference in the way in which the two sexes responded to this idea. Only 43 per cent of the men who changed major listed it as a factor while 50 per cent of the women in the same group did so. Similarly, 94 per cent of the women in the group that did not change major listed it as a reason for not changing major while only 82 per cent of the men did so. Several of the young
women indicated that they were about to get married and wanted the teaching certificate in case of an emergency need. But several of the young men explained their statements in terms of feeling that they believed there would be greater future demand for workers in the field of their new major rather than in their former major.

Since several students had expressed dislike for instructors in the field of their former major as a reason for change of major, this idea was presented to the group that did not change major in the form of "I liked the instructors in my field of study." Eighty-eight per cent of the group indicated they did. It was presented to the group that changed major in the form of "I did not like some of the instructors in my former field of study." Fifteen per cent gave this as a reason for change of major. Several students translated this into a dislike for the methods of the instructor while others said they were uninteresting; few students made a written expression of their reason for dislike.

The statement, "I feel comfortable doing and contemplating what is required in this major," was given a favorable reply by 93 per cent of the group that did not change major. It was presented to the group that had changed major in the form of "I didn't feel comfortable doing or contemplating what was required in the job." Thirty-seven per cent
listed this as a reason for changing major. Since both groups were made up of students with one and one-half to three years of study, it seems likely that they were already fairly well acquainted with the type of work they were preparing to do. The most common type of expressed response that accompanied this question had to do with the monotony of it or the lack of opportunities for interaction with people. One young man left the science area because, as he said,

I don't want to spend my life as a test-tube watcher.

Another said,

I don't care for detailed work, and there seems to be a lot of detailed work required in business.

One man leaving the field of engineering said also,

Although I was good in mathematics in high school, I am having trouble with it in my sophomore year of college. I don't want a major where I will have to work with figures because I am tired of seeing them.

One student who was studying pre-medical courses changed to a major in science because, of late, when he accompanied his father, who was a doctor, into the operating room he would become ill and uncomfortable.

This statement seemed to tap rather well the students' personal reactions to the work represented by their majors, or at least their conception of it. It has not, in all cases, clearly separated the various reasons why they no longer like the work of a previous major because such a
reaction does not explain why one person likes what another dislikes, but it indicates that as a result of becoming acquainted with the work of a vocation, changes take place in students' attitudes toward that work.

Since students frequently stated that they did not like the type of life required of persons in various vocations, this idea was incorporated in the questionnaire. It was presented to the group that did not change major in the form of "The life of people in this vocation appeals to me." Eighty-seven per cent of the group agreed that it did. It was presented to the group that changed major in the form of "I don't like the type of life led by people in that vocation." Sixteen per cent of the group gave this as a reason for change of major. Although this is a fairly high percentage, it is, however, only slightly larger than the 13 per cent of the other group that answered in a similar manner. In other words, there seemed to be nearly as many in the group that did not change major who disliked the life led by people in the vocation represented by that major as there were in the group that changed major. Either this is not as irritating a factor with them or for some reason they do not feel free to change major.

In order that further opportunity may be available to explore their reaction to their chosen vocation the group that had not changed major was presented with the statement,
"The work in this vocation seems to be free from the drudgery of other jobs." Only 67 per cent of the group felt that it was. The same idea was presented to the group that changed major as, "I found that some activities in that vocation were plain drudgery." Thirty-two per cent of the group that changed major thought that was true of their former major and listed it as a reason for change. About the same percentage in each group felt that there were elements of drudgery about the vocation.

Since there was some tendency to complain of teachers, the idea was presented to the group that did not change major as, "Teachers in this department are competent and well qualified." Ninety-three per cent agreed they were. It was presented to the group that changed majors as, "Teachers in my former department seemed to have little to offer." Thirteen per cent agreed that was true. No student elaborated on this except one who stated that he wished to change major because the teachers in that department did not teach in a way to interest him. He had been getting his poorest grades in the courses of his own major.

The influence of close relatives was also mentioned frequently. This idea was presented to the group that did not change major as, "Some of my close relatives enjoy working in the area of my chosen vocation." Only twenty-eight per cent of that group said this was true. It was presented to the group that changed major as, "I have close
relatives who enjoy working in the area of my new vocation."
Eighteen per cent of this group indicated this was true and that it was related to their change of major. Both groups seemed to indicate that the presence of close relatives working in a vocation made that vocation more attractive to them, but the issue is not clear because of other possibilities.

In an attempt to determine the effect that advice of the counselor has on change of major or persistence of major, the idea was presented to the group that changed major in the form of "My counselor advised me to continue study in this major." Only 42 per cent of the group indicated this was true for them. It was felt this was a poor stimulus statement in that it might indicate lack of contact with the counselor rather than his approval or disapproval of the major. It was presented to the group that changed major in a more meaningful way, "My counselor advised me to change major." Only 15 per cent indicated this was true. This would indicate that most decisions of this nature are made without the advice of the counselor.

In a few cases, however, it was the single factor in change of major. Where young men were expecting to do graduate work in preparation for the ministry, their counselor's advice frequently was to change major at the end of their sophomore year from religion to either psychology, philosophy, or English so they would have a more
general education at the time they reached the period of concentrated study.

A few students made another type of major change on the advice of their counselors. Prospective secondary education teachers were frequently told to change major to the area of their teaching subject since it was felt this gave them a stronger program and a more meaningful degree as well as professional status in education.

With increased emphasis on counseling, the effect of the counselor will doubtless be more important as a factor in change of major. At the present as far as this study is concerned and as far as this school is concerned, the initiative for change of major seems to be left to the discretion of the student and his parents.

The effect of work experience was considered to be important since, if it were present, it would be a good basis for decision. This idea was presented to the group that did not change major in the form of "Actual experience doing the work I was preparing to do confirmed my interest in this major." Sixty-four per cent of the group indicated this was true. This seems like a rather high figure, particularly since this question was singled out for special instruction in giving the questionnaire. It was presented to the group that changed major in the form of "Actual experience doing the work I was preparing to do caused me
to change my major." Twenty-nine per cent of this group said this was a reason for change of major. This was explored with several students in personal interviews. Some felt that doing chemical experiments was similar to what they would do as chemists. Others cited experience in teaching Sunday School classes or similar activity in which they worked with children or youth as experience in teaching. Another said that after he had been forced by necessity to help a child who was badly cut-up in an accident he knew he did not want to go any further with medicine. These students seemed to feel they had experienced a sample of the work and had formed a very definite opinion about it as a result.

While the group that did not change major showed no difference where the responses of the men and women were compared to each other, there was a difference between the responses of the two sexes in the group that changed major. In this case, more women than men felt that actual experience doing the work influenced them to change.

Responses to these stimulus statements would indicate that realistic counseling should be related to a realistic work experience on the part of the counselee. Also, it would indicate that more should be done to provide the counselee with information about the work of people in the various vocations so that decisions could be based on more
realistic comparisons. Counselors might also be more helpful to their counselees if they had experienced a wide variety of work experience so that they can do more realistic jobs of acquainting students with the characteristics of various vocations.

Since some students indicated they felt some majors failed to prepare students for any specific jobs, this idea was presented to the group that did not change major as, "I have not felt the need to change to a major representing a more specific vocation which leads to a specific job." Seventy-eight per cent indicated this was true. It was presented to the group that changed major as, "I wanted to prepare for a recognized vocation in which jobs are available." Forty-two per cent indicated this was true and was a reason for change. If this is a true meaning of their responses, it would indicate that persons who changed major were conscious of a need to study a major that would give them a preparation to follow a specific and common vocation. They would indicate also that earlier choices might have been less realistic.

The differences in the way the sexes answered this statement seemed to bear this out also. In the group that changed major, there were considerably more women who indicated this was true of their choice than men. It would
seem that since women are somewhat less likely to be looking for a means of earning a living, they would have a greater tendency to enroll in less practical courses than men when they enter college. If they later felt a greater need to prepare themselves for earning a living, they would be likely to make a change in the direction of getting a definite skill in a definite vocation. This was frequently mentioned in remarks of young women who started in such vocations as art and music and changed to education. Another student who planned to be married reasons in this way:

I plan to be married very soon, and a teaching certificate would have a more definite security for me than a degree in religious education.

One young woman changed from art to education and gave this as her reason:

I didn't feel secure with art as a major. I didn't feel I was learning enough facts that I could apply to earn a living.

The need to face the eventuality of earning a living seemed to be a part of the thinking of students who were changing major. This caused them to seek the training that would have greater chance of providing them with employable skills.

An important indicator of success is grades made in class work. This idea was presented to the group which did not change major in the form of "I am making good grades in courses pertaining to my major." Eighty-four per cent answered this in a manner to indicate it was true for them.
It was presented to the group that had changed major in the form of "I felt I could make better grades in courses pertaining to my new major." Forty-nine per cent of the group that changed major felt this was true for them. This seems to be one of the better indicators that students change major because of lack of success in the previous major.

There was a difference in the way the sexes responded to this question in that 52 per cent of the men said this was true while only 44 per cent of the women responded in that manner. Characteristically women as a group make, on the average, considerably better grades than do the men at the college where this study was conducted. Since nearly half of the group that changed major checked this as a reason and since grades are so important to college students, the tendency to seek a major in which they hope to experience a higher degree of success must be considered an important motive in change of major.

Summary

When nearly four hundred students were given the opportunity to respond to questionnaires made up of statements pertaining to reasons for change of major or persistence of major, it was evident from their responses that they felt there were many factors involved. None of the twenty-five stimulus statements failed to attract both yes and no answers from each of the groups.
1. Students who changed major stated very frequently that they had experienced a change in interest since entering college. Students who did not change major maintained even more strongly that they were still interested in the same kinds of work as they were when they entered college.

2. Students who changed major indicated strongly that they thought they could get better grades in their new major. Those who did not change major felt just as strongly that the desire for better grades would not cause them to change major.

3. The replies of many students indicated that they were unfamiliar with academic requirements at the time they entered college and that this contributed to change of major.

4. Lack of occupational information was also indicated by replies in which students said actual experience doing the work caused them to change major.

5. The questionnaire responses tended to verify the quantitative studies but also indicated that in a few cases individual and personal reasons were important causes of change of major.
CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The problem of this study was to determine the factors associated with change of major in college students. Six questions were posed to which answers were sought. Since the procedures used to obtain answers to these questions varied from one problem to another, each question and the procedures used in connection with it are listed and summarized separately.

1. The first question was: Is academic success related to change of major? Stated in the form of an hypothesis to be tested it was:

   1. Students who are unsuccessful in academic work required by their major show greater tendency to change major than students who are successful.

   The result of calculating chi square to test the independence of lack of academic success and change of major in their sophomore and junior years, produced a chi square of 26.45 which with one degree of freedom is significant beyond the .001 level. This indicated that lack of academic success was related to change of major in college students.

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A second study of the same association was conducted in the same manner using the same procedures. The group used in this study was composed of 107 male students majoring in physics or engineering. One year of study was the basis of the first period of this study.

The result of calculating chi square to test the independence of lack of academic success and change of major with reference to this group was chi square = 15.57. With one degree of freedom, this was significant at beyond the .001 level. Lack of academic success was related to change of major for this group.

When 70 students who remained from this group to register for their fifth semester of college were studied in the same manner, similar results were obtained. The result of calculating chi square to test the independence between lack of academic success and change of major was chi square = 27.68. With one degree of freedom, this was significant at beyond the .001 level. As a result of these three studies the hypothesis of no relationship between academic success and change of major was not tenable and the conclusion was that academic success was related to change of major.

2. The second question was: Is mental ability associated with change of major? Stated in the form of an hypothesis this was: Mental ability is related to change of major in that students who change major will show less
mental ability as indicated by total raw scores on The American Council on Education Psychological Examination than will students who do not change major.

The result of testing the significance of the difference between the means of groups of 114 students who changed major and 118 students who did not change major was $t = .14$; the difference was not significant. In a heterogeneous group of students mental ability was not associated with change of major.

To control the influence of subject matter, a second sample was used, all of whom had majors in physics or engineering. The result of testing the significance of the difference between the means was $t = 6.65$, which with 87 degrees of freedom was significant at beyond the .001 level. The null hypothesis was abandoned. The conclusion was mental ability was related to change of major when the influence of subject matter was held constant.

3. The third question was: Is change of interest related to change of major? Stated in the form of an hypothesis this was: Students who change major will show greater tendency to change interest than students who do not change major. Tests of the significance of the difference between mean changes for each of the nine scales for each of the groups were used. Where the groups were heterogeneous from the standpoint of major both the group
that changed major and the group that did not change major showed significant changes in some scales. The group that changed major showed significant changes on more scales than did the other group.

Where the two groups were homogeneous with regard to major the group that did not change major showed no significant changes of inventoried interest; those who changed major showed significant losses of inventoried interests on three scales and significant gains on two scales. The null hypothesis of no difference was untenable and the conclusion was: In a homogeneous group of college students those who changed major showed a greater tendency to change inventoried interest than those who did not change major.

The answers to questions four, five, and six were sought from the responses to questions on the questionnaires and responses in personal interviews. The fourth question was: Are there reasons that are personal and peculiar to the individual that are associated with change of major? The responses of students indicated that in some cases they had changed major because of a reason or reasons that were personal and peculiar to them as individuals but such reasons were given very infrequently.

5. The fifth question was: Is inadequate occupational information related to change of major? The replies of one
third of the students who changed major indicated that lack of occupational information was a reason for change of major.

6. The sixth question was: Do social reasons such as a desire for a vocation with greater prestige, increasing interest in being of service to people, or having to conform to the wishes of parents or relatives relate to change of major? Responses of students indicated that in a few cases they were influenced by social or family situations so that change of major was made necessary. However, these were mentioned infrequently. Only 16 per cent of the group that changed major gave this as a reason. A few of that group commented on that point in personal interviews but this also was an infrequent occurrence. One fourth of the students who changed major indicated that a desire to be of more service to people was a reason for change of major.

The study on change of interest also showed that in a heterogeneous group of students this was a trend common to all of them. A desire to be of greater service to people was not limited to students who changed major.

Conclusions

The analysis of the results of this study led to the following conclusions:

1. Lack of academic success is related to change of major in college students.
2. In a heterogeneous group of college students the relationship of mental ability to change of major was not demonstrated.

3. In a group of college students who were homogeneous with regard to major the students who changed major had significantly lower mental ability when compared to those who did not change major.

4. College students who changed major had greater tendency to change inventoried interests than students who did not change major.

5. Lack of occupational information contributes to change of major in college students.

6. College students change major infrequently for reasons that are of a social nature.

7. The desire to be of more service to people was given as a reason for change of major but interest inventory scores indicated this was a common trend with most students.

8. Most students change major because of lack of success rather than for personal reasons peculiar to a few individuals.

Recommendations

1. Colleges should offer more exploratory courses to entering students. This research indicated that students were poorly informed with regard to the types of activities
in which they would be engaged while studying for a major. These courses should be of such nature that they would give the student a general acquaintance with the subject matter field as well as considerable information about the occupation.

2. Students should be encouraged to take more time to choose a major. Students who choose an inappropriate major run the risk of extensive loss of credit and failure through early specialization. If they were encouraged to take a general course while they explored difficult and unfamiliar work they might make more steady progress.

3. Colleges should give their entering students more information on academic requirements for the various majors available. A student should receive a degree plan as soon as he declares a major. This would give him a better opportunity for learning what he will be expected to do as well as expose him to academic counseling.

4. More attention should be given to determination of whether or not a student has sufficient ability to complete a major before he is allowed to declare it his choice. Most colleges use scholastic aptitude tests in connection with admission or orientation of students. Careful study of the success of other students should reveal the minimum scores consonant with various levels of success in the available majors. Students should receive any information that is available which would help them evaluate
their probable success in a given major before they should be allowed to make it their choice.

5. Colleges and universities should give more complete counseling to entering students than they do at present. This research showed that frequently the effects of unwise choice of major were lack of success and change of major. However, many students have been allowed to enter college and choose majors that they could not complete even though their imminent failure could have been predicted in many cases. If students were given more complete counseling great saving could be effected. Fewer students might attempt majors that were impossible for them and less instruction would be wasted on students who could not be expected to profit from it. Also many students who would not be successful without counseling could receive the benefits of higher education.
APPENDIX

Form 1

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Class</th>
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</thead>
<tbody>
<tr>
<td>Last</td>
<td>First</td>
<td>Middle</td>
</tr>
</tbody>
</table>

Sex | Major: On entering | Changed | to | Date |
|-----|--------------------|---------|----|------|

<table>
<thead>
<tr>
<th>Interests:</th>
<th>Test</th>
<th>Retest</th>
<th>Diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical</td>
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<td>Computational</td>
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<td>Musical</td>
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<td>Social Service</td>
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<tr>
<td>Clerical</td>
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A. C. E. Raw Score | Q | L | T |

Reason for change of major:
**Questionnaire on Change of Major**

**Form 1**

Below you will find a number of statements given by other students as reasons why they changed major. Some of them probably apply to you. Please read each statement carefully, then decide if that factor was present at the time you were considering a change of major. If it was and the statement is mostly true, put an X in the mostly true column. If it is mostly false as applied to you, mark an X in the mostly false column. If that factor was not present, mark an X in the does not apply column.

<table>
<thead>
<tr>
<th>I changed major because:</th>
<th>Mostly True</th>
<th>Mostly False</th>
<th>Does not Apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I found that I have developed new interest in different kinds of work since I started college.</td>
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<td>2. I found that the class work involved was dull and uninteresting.</td>
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<tr>
<td>3. It required more reading than I cared to do.</td>
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<tr>
<td>4. There were too few members of the opposite sex studying this major.</td>
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<td>5. To complete the major would require more sacrifice than I was willing to make.</td>
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<tr>
<td>6. Mathematics was somewhat of a barrier to me.</td>
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<td>7. I wanted a vocation that would give me more prestige.</td>
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<td>8. It did not offer sufficient opportunity to help people.</td>
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<td>9. I found the required foreign language too difficult.</td>
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<tr>
<td>10. I didn't have the aptitudes for that major.</td>
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<td>11. The choice of my original major was not entirely mine in the first place.</td>
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<td>12. I felt that it would take too long to complete the study.</td>
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<tr>
<td>13. Because to complete my study I would have had to change schools.</td>
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<tr>
<td>Statement</td>
<td>Mostly True</td>
<td>Mostly False</td>
<td>Does not Apply</td>
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<tr>
<td>14. I admired a teacher in the area to which I changed.</td>
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<tr>
<td>15. The new major offers more job security if I should need it in later years.</td>
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<tr>
<td>16. I didn't like some of the instructors in my former field of study.</td>
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<tr>
<td>17. I didn't feel comfortable doing or contemplating what was required in the job.</td>
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<tr>
<td>18. I don't like the type of life led by people working in that vocation.</td>
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<tr>
<td>19. I found that some of the activities in that vocation were plain drudgery.</td>
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<tr>
<td>20. Teachers in my former department seemed to have little to offer.</td>
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<tr>
<td>21. I have close relatives who enjoy working in the area of my new vocation.</td>
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<tr>
<td>22. My counselor advised me to change major.</td>
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<tr>
<td>23. Actual experience doing the work I was preparing to do caused me to change my major.</td>
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<td>24. I wanted to prepare for a recognized vocation in which jobs are available.</td>
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<td>25. I felt I could make better grades in courses pertaining to my new major.</td>
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</table>

List below or on the back any reasons not mentioned above that might have influenced the persistence of your choice of major.
Form 2

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last</td>
<td>First</td>
<td>Middle</td>
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</tbody>
</table>

Sex | Major: On entering | Changed | to Date |
|-----|-------------------|---------|--------|

<table>
<thead>
<tr>
<th></th>
<th>Changed</th>
<th>to Date</th>
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</table>

Kuder BB Interests: | Test | Retest | Diff. |
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<tbody>
<tr>
<td>Mechanical</td>
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</table>

A. C. E. Raw Score

Reason for change of major:
Questionnaire on Persistence of Major

Below you will find a number of statements given by other students as reasons why they have kept the same major. Some of them probably apply to you. Please read each statement carefully, then decide if that idea was related to the fact that you did not change major. If it was, and the statement is mostly true, put an X in the Mostly True column. If it is mostly false as applied to you, mark an X in the Mostly False column. If that factor was not present, mark an X in the Does Not Apply column.

<table>
<thead>
<tr>
<th></th>
<th>Mostly True</th>
<th>Mostly False</th>
<th>Does Not Apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I find that I am interested in the same kinds of work as when I started college.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>The class work in my major is pleasant and interesting.</td>
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<tr>
<td>3.</td>
<td>I can comfortably accomplish the required reading.</td>
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<tr>
<td>4.</td>
<td>Absence of members of the opposite sex did not detract from the attractiveness of this major.</td>
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<tr>
<td>5.</td>
<td>I am willing to make the sacrifice needed to complete this major.</td>
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</tr>
<tr>
<td>6.</td>
<td>Mathematics is not a barrier for me.</td>
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</tr>
<tr>
<td>7.</td>
<td>I like the prestige associated with my major.</td>
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<tr>
<td>8.</td>
<td>I want to do work where I can help people.</td>
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</tr>
<tr>
<td>9.</td>
<td>I can handle the required foreign language.</td>
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<tr>
<td>10.</td>
<td>My aptitudes seem suited to this major.</td>
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<tr>
<td>11.</td>
<td>I chose this major; no one chose it for me.</td>
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<tr>
<td>12.</td>
<td>I felt I had sufficient time to complete the study.</td>
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<td></td>
</tr>
<tr>
<td>13.</td>
<td>It would not bother me to have to change schools to complete my study.</td>
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<tr>
<td></td>
<td>Mostly True</td>
<td>Mostly False</td>
<td>Does Not Apply</td>
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</tr>
<tr>
<td>14.</td>
<td>Interesting teachers in other areas have not changed my interest in my major.</td>
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<tr>
<td>15.</td>
<td>My chosen vocation offers me job security if I need it in later years.</td>
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</tr>
<tr>
<td>16.</td>
<td>I liked the instructors in my field of study.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>I feel comfortable doing and contemplating what is required in this vocation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>The life of people in this vocation appeals to me.</td>
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<td></td>
</tr>
<tr>
<td>19.</td>
<td>The work in this vocation seems to be free from the drudgery of other jobs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Teachers in this department are competent and well qualified.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Some of my close relatives enjoy working in the area of my chosen vocation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>My counselor advised me to continue study in this major.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Actual experience doing the work I was preparing to do confirmed my interest in this major.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>I have not felt the need to change to a major representing a more specific vocation which leads to a specific job.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>I am making good grades in courses pertaining to my major.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List below or on the back any reasons not mentioned above that might have influenced the persistence of your choice of major.
BIBLIOGRAPHY

Books


Pope, Ruth V., "Factors Affecting the Elimination of Women Students from Selected Colleges of Liberal Arts," Teachers College Contributions to Education, No. 485, New York, Teachers College, Columbia University, 1931.


Sparling, Edward J., "Do College Students Choose Vocations Wisely?" Teachers College Contributions to Education, No. 561, New York, Teachers College, Columbia University, 1933.


**Articles**


Sisson, E. D., "Vocational Choice of College Students," *School and Society*, XLVI (December, 1937), 765-768.

