THE EFFECTS OF CHANGE OF ACADEMIC MAJOR AS A RESULT OF COUNSELING

by

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ABSTRACT

The purpose of the study reported here was to determine whether college students who changed their majors as a result of counseling received through the Student Counseling Bureau improved their grade point averages to a greater degree than those students who changed majors without counseling, if the variables of College Qualification Test scores, sex, and college major were held constant.

Twenty-seven matched pairs of students were utilized and equated on the basis of College Qualification Test scores, sex, and college major--the major to and from which they changed. They were selected from 2,921 first semester sophomore students from a four-year institution. The geographic area under study was located in the southwestern United States, and consisted of a University supporting an undergraduate enrollment of 19,303 students.

Subjects of the study were compared on the basis of pre-change and post-change grade point averages computed on course work taken one full academic year before and one full academic year after changing college majors. The findings from analysis of the data appear to warrant the conclusion that there was no significant difference between groups, and suggested that counseling makes little difference in relation to increasing grade point averages.

CHAPTER I

INTRODUCTION

Research has shown that electing a program of study commensurate with a student's interests, abilities, and vocational designs is of paramount importance in achieving academic success.[1] Educators at the various levels of education have given considerable attention to the problem of occupational goal selection and election of a course of study which will best suit the individual.

There have been considerable numbers of "educated guesses" but little in the way of actual research as to why students change their degree objective while in college. Studies give indication, however, that from 40 to 70 percent of college students change majors at least once during their college careers.[2]

In the literature available, "change of degree objective" is more generally referred to as "change of

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1. J. W. French, "Aptitude and Interest Score Patterns Related to Satisfaction with College Major Field," Educational and Psychological Measurement, 21:287-294, 1961.

2. E. D. Norton, "An Investigation of Interest, Aptitude, and Performance Measures as they Relate to Degree Objective - Changing Behavior of Selected Counselees," Unpublished Ph. D. Dissertation, Purdue University, 1963, p. 18

college major."[3] The studies attempt to relate change of major to other factors, such as the students' lack of academic success, family and peer influence, lack of knowledge about curriculum and goal expectation, or lack of adequate information about themselves.

The long-range implications of this problem include the well-being and personal satisfaction of the individual throughout his lifetime. His academic and personal success in college are dependent to a large measure upon the course of study which he elects, and for which he feels best qualified.

The problem of selecting a degree objective will continue, with the increasing number of students enrolling in colleges and universities, and increasingly rigorous requirements and specifications within the various disciplines. Changing degree and occupational objectives may not necessarily be negative. In many instances, however, it is an inefficient means of gaining an education, time-consuming and expensive, not only for the student who has to change, but also for the institution.

The over-all ramifications of a problem of this nature are broad in scope, and for the purposes of study

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3. R. R. Pierson, "Changes of Majors by University Students," Personnel and Guidance Journal, 40:458-461, 1962.

need to be concentrated. The intent of this study is to determine if the services of a college counseling bureau can help students attain academic success by assisting them in the selection of an appropriate program.

Statement of the Problem

The purpose of this study is to answer the questions: Do students who change college majors as a result of counseling improve their grade point averages by so doing? Is such a change significantly greater than that of students changing without benefit of counseling?

Null Hypothesis to be Tested

The following null hypothesis, which will order and provide direction to the study, will be tested:

> There is no significant difference between the mean change in grade point average of students who changed their majors subsequent to counseling (College Counseling Bureau) and the mean change in grade point average of students who changed their majors without assistance provided by a counseling bureau.

Assumptions, Definitions and Limitations

The principal assumptions underlying this study are:

1. The background differences between the groups

were not significant; both groups were matched as evenly as possible as to admission test scores, sex, and college.

2. There is no significant difference in counseling techniques within the counseling bureau.

3. The study was conducted by a single researcher. In some cases where judgments entered as to the client's stated reasons for counseling, the ultimate decisions rested with the researcher and were not subjected to cross-validations.

Definitions

The following terms employed in this study are defined as follows:

Academic performance. To be defined as grade point average figured by the University of Arizona Registrar's Office.

Counseling. A one-and-one relationship in which a trained counselor attempts by verbal means to assist the client with respect to educational, emotional, and vocational issues, using the facilities of the Student Counseling Bureau.

Student. A sophomore who is carrying a full academic load of no less than twelve and no more than seventeen

hours as determined by the University Registrar's Office.

Pre-change grade point average. Grade point averages computed on course work and taken one full academic year before changing majors.

Post-change grade point average. Grade point averages computed on course work and taken one full academic year after changing majors.

Academic major. The concentration of study elected by the student in the academic program set by the University. The field of study which the student has officially filed with the University Registrar's Office.

Success in college. In this study, success is defined narrowly as earned grade point average.

Limitations of the Study

1. The subjects of this study are from a single sample taken in a given institution; therefore, the generalizations from this study are applicable only where conditions are comparable.
2. Only first semester sophomores who changed their academic programs during their sophomore year (1962-1963) who this year (1964-1965) should have senior standing were selected. First semester was selected over second because grade point average could not be secured

three semesters after the change occurred, and data being researched were available only through the fall of 1964.

3. The researcher did not seek to determine control of motivation toward counseling. It is possible that the person who seeks counseling may be different from a person who does not.

Summary

Educators recognize the importance of the election of a course of study which best suits a student's interests, abilities and vocational goals. There appears to be a need for more concentrated study in this area, due to the larger numbers of students now enrolling in colleges and universities. This study proposes to determine if the services of a college counseling bureau can assist a student in the selection of a program which is appropriate for him.

In Chapter II, a review of the significant and related literature pertaining to change of college major is presented. The methods used in the investigation are described in Chapter III. The findings are presented in Chapter IV, and the summary and conclusions drawn from the completed study are given in Chapter V.

CHAPTER II

REVIEW OF RELATED LITERATURE

Little research has been conducted concerning college students who change their degree objectives. In the literature available "change of degree objective" is more generally referred to as "change of college major."[1]

Incidence of Change of College Major

Fryer found that approximately 17 percent of college students change majors before the sophomore year, and approximately 71 percent changed majors during the first three years of college.[2] Factors related to change of major by college students indicated that when students are unable to complete the course work required for one major, they attempt to determine whether or not they would

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1. R. R. Pierson, "Changes of Majors by University Students," Personnel and Guidance Journal, 40:458-461, 1962.

2. Douglas Fryer, Measurement of Interests (New York: Henry Holt and Company, 1931), 369 pp.

be able to develop satisfactory interest in a new major which involves different types of work.[3]

Most studies related to the subject gave indication that from 40 to 70 percent of college graduates throughout the nation changed majors at least once during their period of study.[4] Pierson's study found that 31 percent of the baccalaureate candidates of 1958 at Michigan State University would graduate in a field other than the one they selected as freshmen. He indicated that twice as many students changed degree objectives as changed options within a degree objective.[5] Gamble's research supports Pierson's findings.[6]

Counseling as a Basis for Occupational Goal Selection

As previously indicated, determining a course of study which seems to best suit a student's interests, abilities, and vocational goals is important to his academic success. Deciding these goals, with all their

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3. Norton, op. cit., p. 18.

4. Norton, op. cit., p. 18.

5. R. R. Pierson, "Changes of Majors by University Students," Personnel and Guidance Journal, 40:458-461, 1962.

6. G. W. Gamble, "Pre-College Experience and Curricular Changes by College Students," Personnel and Guidance Journal, 40:561-564, 1962.

social, personal, and performance implications is a primary task in most lives. When counseling focuses in this dimension, the total personality is inevitably involved.[7]

Counseling, therefore, serves in this chapter as a frame of reference for studies which bear on this central problem, though are not always directly related to this particular study.

Reasons for Change

French attempted to relate aptitude and interest scores with satisfaction with the college major. He found that approximately 25 percent of the students in his study had been dissatisfied with their majors. He indicated that students lacked adequate information about the curriculum, and adequate information about themselves.[8]

Warren related change in college major with self-concept and occupational goal expectation. Using grade point average and a "thinking introversion" scale to differentiate changes from non-changes, he found that multiple

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7. L. C. Rudikoff, and B. A. Kirk, "Goals of Counseling: Mobilizing the Counselee," Journal of Counseling Psychology, 8, No. 3, 243-249, 1961.

8. J. W. French, "Aptitude and Interest Score Patterns Related to Satisfaction with College Major Field," Educational and Psychological Measurement, 21:287-294, 1961.

changes do occur more frequently in cases of extreme discrepancy between self-concept and occupational role expectation. This appears to substantiate French's findings. Warren indicated that "Students with low grade point averages may be expected to change their fields in an effort to find one in which success comes more easily."[9]

Students' Interests Reflected in Grades

A study by Klingelhofer indicated that the student's interest and skill in academic tasks were chiefly reflected in grades. Therefore, the study suggested that "Grade point average is an acceptable criterion measure for the evaluation of the effects of academic advisement on the scholastic performance of failing students."[10]

This study suggested that improved academic performance of scholastic probationers is associated with an organized counseling program. The counseling method employed by Klingelhofer was dictated by the pre-given

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9. J. R. Warren, "Self-Concept, Occupational Role Expectation and Change in College Major," Journal of Counseling Psychology, 8:164-169, 1961.

10. E. L. Klingelhofer, "The Relationship of Academic Advisement to the Scholastic Performance of Failing College Students," Journal of Counseling Psychology, 1: No. 3, 125-131, 1954.

counseling situation, and the fact that survival is a function of academic performance.[11]

Counseling should have a positive effect on college achievement, as suggested in a study by Watson of students who had been counseled in Brooklyn College.[12] In this study, counseling appeared to help students improve academic standing, and to remain in college. However, as the writer has already indicated in this study under the third limitation, the fact that a student is able to recognize the need for help while another cannot, indicates a personality difference. Personality change and growth are complex and no one factor can be singled out as the agent of change.

Counseling is not the sole basis for change, but it does seem that the lack of counseling help, following intensification of emotional conflict may cause calamity, and counseling does help a student to stabilize himself, and to begin to use his powers more effectively.[13]

With counseling, grades show a slight upward trend and wavering determination becomes firmer.[14] Counseling

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11. Ibid, p. 129.

12. G. H. Watson, "An Evaluation of Counseling with College Students," Journal of Counseling Psychology, 8: No. 2, 99-104, 1961.

13. Ibid, p. 101.

14. Ibid, p. 102.

bureaus hope that changes in behavior as well as in grades will result from their work with students.[15]

Watson's study made no attempt to prove that counseling alone was responsible for these results. Rather, it pointed out that the student with a personality structure that permitted him to accept help was able to utilize his forces in constructive ways. Therefore it seemed likely that counseling can serve as a catalytic agent. Although counseling may have been one of the many forces playing upon the individual, it may have been a crucial one.[16]

Graduation as a Measure of Counseling Success

In a study by Shepherd, designed to measure outcome of counseling, two hypotheses were researched: (1) "There is no difference in college graduation rate between students registering for and receiving counseling, and students neither registering for nor receiving counseling." Both groups were matched as to sex, enrollment, and academic ability, and (2) "There is no difference in college graduation rate between the counseled students with various kinds

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15. Ibid, p. 103.

16. Ibid, p. 104.

of problems."[17] Both hypotheses were rejected using the 1 percent level of confidence. In neither case was there a significant difference in academic ability.[18]

In Shepherd's study, the findings of the first hypothesis approximate those of Toven. Toven used academic advisors, while Shepherd used graduate students, and this may have flavored the counseled group, because someone took the time to listen and to provide information to the student.[19] A similar conclusion was reached by the "Hawthorne Studies," which concluded, "It is not so much what is done for students (or employees) as that some notice is taken of them."[20]

In a study conducted by Faries a significantly greater proportion of counseled students graduated than did non-counseled, as compared to Toven's study. The reason for this may be that in Toven's study, students were seen by faculty advisors.[21] In Faries' study, the counselor was provided with pertinent data and a large

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17. R. E. Shepherd, "The Relation of Counseling and Student Problems to Graduation," Journal of Counseling Psychology, 12: No. 3, 244-247, 1965.

18. Ibid, p. 246.

19. Ibid, p. 247

20. Ibid.

21. J. R. Toven, "Appraising a Counseling Program at the College Level," Occupations, 23:459-466, 1945.

amount of factual data was available for use in the first interview, and counseling was voluntary.[22]

Motivation

Faries matched one hundred and forty counseled freshmen with an equal number of non-counseled freshmen to determine whether the numbers graduating from each group showed any difference. Counseled students graduated in greater number than did their control group partners who received no counseling. Faries' largest uncontrolled variable would appear to be the factor of personal motivation of the counseled student.[23]

Magoon, Hoyt, Volsky, and Norman had similar results in 1957, using a control group motivated for counseling. Their studies indicated that motivation to seek counseling may not facilitate the earning of a college degree as much as does the actual counseling itself. "Since there was no significant difference in academic ability between the counseled graduated and the counseled non-graduated groups within any of the diagnostic categories, it should not be

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22. M. Faries, "Short-Term Counseling at the College Level," Journal of Counseling Psychology, 2: No. 3, 182-184, 1955.

23. Ibid, p. 183.

stated that graduated groups did so because they had greater academic ability than the non-graduated group."[24]

Adjustment to College

In a study conducted during the 1930's by Williamson and Bordin, counseled students made better adjustment to college, and achieved higher grade point averages than non-counseled students.

Campbell, following the Williamson-Bordin population in 1963, sought to determine if there were any lasting differences between the counseled and non-counseled groups in their adult achievement.[25] The results indicated that the counseled group was considerably more successful academically, and slightly more successful as adults. Campbell concluded that "Counseling is best justified as an immediate help to students bewildered by the increasingly complex mass of educational and occupational opportunities."[26]

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24. T. M. Magoon, D. P. Hoyt, T. Volsky, and W. T. Norman, "Research in Counseling and Case Work: Theory, Methodology, and Outcomes," Bureau of Counseling Report, University of Minnesota, 1957. (Mimeographed)

25. D. P. Campbell, "Achievements of Counseled and Non-Counseled Students Twenty-Five Years after Counseling," Journal of Counseling Psychology, 12: No. 3, 287-293, 1965.

26. Ibid, p. 287.

Methods Employed to Assist Students in Degree Selection

A problem encountered by counselors in college is the selection of a college major the student wishes to make, usually during his sophomore year. The problem revolves around the major field of concentration to which the student should devote his time in his last two undergraduate years. The methods by which the counselor may assist the student in this crucial decision during his college program vary.

Methods of assisting in the selection of a college major were discussed by Dunn. This study purported to investigate the validity of two procedures.

1. "Determine to which group a student seems to 'belong' in terms of his likeness (in test scores of other measures) to those who have successfully completed concentration requirements in a given field (statistically known as multiple discriminant analysis)."
2. "Predicting how great his success will be in terms of the grade average to be expected in each field (the commonly-used technique of multiple regression analysis)."[27]

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27. F. E. Dunn, "Two Methods of Predicting the Selection of a College Major," Journal of Counseling Psychology, 6: No. 1, 15-25, 1959.

A summary of the two procedures indicated that the "highest success" criterion in terms of grades to be expected is often not a valid means of predicting relative achievement.

Using grade point average as a criterion measure runs counter to many recommendations appearing in the literature.[28] The observation that grade point averages are unreliable must also be recognized.

However, the usefulness of the grade point average as a predictor of college achievement is not generally equaled by other measures, and while it may be less reliable than we wish, it is a useful measure in its own right.[29] Grade point average is fairly stable over a period of time, with coefficients of equivalence and stability averaging about .60.[30]

Dunn stated that "Analysis of the data helps establish that advising an individual to select the field in which he can be expected to make the highest grade point average would not be apt to result in a choice of a field

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28. E. G. Williamson, and E. S. Bordin, "A Statistical Evaluation of Clinical Counseling," Educational and Psychological Measurement, 1:117-132, 1941.

29. Klingelhofer, op. cit., 130.

30. State University of Iowa, Office of the Registrar, Bulletin No. 4. "The Scholastic Achievement of students entering the College of Liberal Arts in September, 1949," Student Personnel Service Publication, Iowa City, January, 1951.

which would challenge abilities or give companionship of mind."[31] The following is an excerpt from Dunn's study:

> It seems clear that the use of discriminant analysis may have great value for guidance and that further attempts to perfect the method and apply it to problems of educational and vocational choice should be made. Although the procedure is costly in time and money, further research seems amply justified by such evidence as that obtained in this pioneering study.

In commenting on the Dunn study, Dressel pointed out that the data from the study are a prelude to understanding how to counsel freshmen, using either analysis. The problem of prediction about a field of study appropriate for the student and his success is important. "No probability can be attached to the statement except as the individual is viewed as one of a group, some of whom will succeed and others fail. Accordingly all students and especially the marginal student will be aided by favoring not only the fields appropriate in terms of their patterns of abilities, but also in terms of the expected degree of success in these fields."[32]

Dressel concluded that the results of either analysis depend on the variables originally incorporated in the process. "Statistics, after all, can only aid the counselor; and the two combined can only aid the individual to make his own choice in the light of his own values."[33]

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31. Dunn, op. cit., 27.
32. Ibid.
33. Ibid.

Summary

In general, educators in institutions of higher learning will accept counseling services as a valuable part in planning educational programs. Most of the studies give indication and support to the theory that counseled students tend to be more successful than non-counseled students.

Effective evaluation of the results of counseling has long been recognized as necessary. The development of reliable measures to assess results of counseling are needed, for without this assessment students cannot be expected to grant their continued support.

CHAPTER III

RESEARCH PROCEDURE AND METHOD

The methods employed to collect and analyze data are presented in this chapter. Described herein are the main areas of investigation: I. Setting; II. Description of the Population; III. Selection of Experimental and Control Groups; IV. Methods of Comparison.

I. Setting

The University of Arizona, established in 1862 as a Land Grant College, has experienced rapid growth within the past fifteen years. From a student population of 6,227 in 1950-1951, the University now has a total of 19,303 students in 1965-1966. From a total of ten colleges in 1950-1951, the University has expanded to fourteen.[1] This expansion in colleges has meant increased selection in academic programs for the student population. Selection of programs which best suited students' interests, abilities, and vocational designs has become a critical problem within this rapidly expanding institution.

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1. From the Records of the University of Arizona Registrar's Office, Tucson, Arizona.

An increasing awareness of the incidence of academic and vocational indecision by both faculty and administration resulted in the organization of the Student Counseling Bureau in 1959 under the auspices of the Liberal Arts College and the Department of Psychology. "The Bureau, a division of the Department of Psychology, offers students professional counseling in educational, personal, or career problems. The most common service is assistance in identifying aptitudes, interest, and personality traits for consideration in choice of a vocation or educational program."[2]

The Bureau staff consists of five counselors, one psychometrist, and a reading specialist. During the year 1965, 1,464 students utilized the services of the Counseling Bureau.[3] Information about the Bureau is given in the University catalogue, the Freshman Handbook, and during Freshman Orientation Week. Some referrals are made by teaching faculty and student personnel administrators, but most students learn about the Bureau from their friends. Though the presenting problems vary widely in nature, a great number fall into the vocational and educational

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2. University of Arizona Biennial Catalogue, Vol. LVIII, No. 3, June 1965, p. 179.

3. Dr. Newton James, Annual Report of the University of Arizona Student Counseling Bureau, 1965.

areas, and the orientation of the Bureau continues to be primarily a vocational counseling service.

II. Description of the Population

The subjects of the study consisted of fifty-four University of Arizona students who changed their academic majors during the first semester of their sophomore year in 1962-1963, and who consequently attained senior standing in 1964-1965. These fifty-four students were arranged in twenty-seven pairs, each pair consisting of one counseled sophomore and one non-counseled sophomore. In the study the two groups of sophomores were matched as evenly as possible on the basis of College Qualification Test scores, sex, and college major--the major from and to which they changed. The experimental group was composed of those students who changed majors after using the services of the University Counseling Bureau, while the control group changed majors without using the services of the Counseling Bureau.

The total number of students from which experimental and control group samples were taken was based upon data obtained from the Registrar's Office, the Special Projects Office, and the Student Counseling Bureau files. These data determined those students, with sophomore standing, who actually changed majors, and those who sought counseling for the purpose of changing majors.

Of the 3187 students with sophomore standing listed by the University of Arizona Registrar's Office, 2921 were classified as first semester sophomores. This 2921 comprised the total population from which all data were derived for this study.

Factors considered: First semester sophomores were selected for this study for various reasons. First of all, the experience of Bureau personnel indicated that sophomores select or change majors in greater numbers during the first semester of their sophomore year, because having completed a year of college, they have better insight into what is required for majors than they did as freshmen. Another reason for selection of first semester sophomores was essentially opportunistic. Final grade point averages would not be completed (Chapter I, Limitation 2, p. 5) for second semester sophomores three semesters after the change occurred, while this study was being conducted. This would be in the spring of 1965, and the data being researched were available only through the fall of 1964.

III. Selection of Experimental and Control Groups

From the numerical print-out sheets, secured from the Special Projects Office, which lists the student's name, matriculation number, age, and sex, the 3,852 sophomores were compared with the records of the University

Counseling Bureau. Investigation indicated that 278 sophomores had used the services of the Counseling Bureau. To determine those students who sought counseling for the purpose of changing majors, the researcher examined each counselee's folder. The researcher sought stated reasons expressed by the student on the information sheet as to why counseling was requested. From the 278 folders examined, it was determined that 158 sought assistance in order to change academic major or vocational goal. It should be indicated that the student's decision for change of major and the Counselor's interpretation of the student's reasons for seeking counseling had to concur. There were cases in which the reason stated in writing by the counselee was apparently not the underlying reason for seeking counseling. In some cases, students are reluctant to state the underlying reasons for seeking counseling. It is not until the counselor has worked with the student that the underlying purpose for counseling is learned. Therefore, the researcher felt it was of importance that the student's stated reason for counseling (that of academic or vocational change)concur with the summary report given by the counselor.

Experimental group. Comparing information gathered at the Student Counseling Bureau with later records from the Registrar's Office, 72 of the 158 students seeking to

change majors actually made an academic change. These 72 students comprise the original population of the Experimental Group.

Official transcripts for each student provided information which further delimited the Experimental Group.

1. Sixteen students did not carry or complete enough hours to be considered in computing a grade point average for this study.
2. Nine students made a change, and then in a subsequent semester made another change of major. These students were eliminated because of difficulty in matching with the control group. This study was not concerned with re-shift of majors after counseling.
3. Fourteen students dropped out of school. This study did not try to determine the reasons for attrition.
4. Four students transferred to other colleges or universities.
5. Two students could not be accounted for. It was noted by the researcher that both of these students were female, and it is possible that they were married, and names were changed.

Consequently, of the 72 students in the original grouping, 27 were used in this study. These 27 students then comprised the total number of the experimental group.

The following gives indication of the twenty-seven cases, the fields from which and to which they changed:

Number	Sex	From	To
1	M	Liberal Arts	Fine Arts
2	M	Liberal Arts	Agriculture
3	M	Liberal Arts	Education
2	M	Engineering	Business, Public Administration
4	M	Liberal Arts	Business, Public Administration
1	F	Liberal Arts	Home Economics
1	M	Business, Public Administration	Liberal Arts
1	F	Home Economics	Fine Arts
1	F	Business, Public Administration	Home Economics
3	M	Engineering	Liberal Arts
1	M	Engineering	Agriculture
1	M	Mines	Business, Public Administration
1	F	Business, Public Administration	Liberal Arts
1	M	Fine Arts	Business, Public Administration
1	F	Fine Arts	Education
1	M	Liberal Arts	Pharmacy
1	M	Fine Arts	Liberal Arts
1	M	Business, Public Administration	Education

Subsequent to this delimiting of the Experimental Group, grade point averages were computed twice for each individual student. The first computation was made before and during counseling (Fall, 1961 through Fall, 1962) and the second was made after counseling had taken place (Spring of 1963 through Spring, 1964). Each computation included three full semesters of academic work.

The first computation was obtained from the University Registrar's Office by going through official records of each student's grade point average. A second computation had to be made for each student, starting with the spring of 1963. The reason for this was that a new grade point average, after change of major, had to be obtained. In order to assure accuracy electric calculators were used, and each grade point average was computed twice.

After this had been completed, the College Qualification Test scores were added to each record kept by the researcher. (See Appendix A for sample research record.) College Qualification Test scores were obtained from the University Counseling Bureau.

Assured that all twenty-seven cases met the cirteria set by the study, the researcher obtained copies of the students' transcripts from the Registrar's Office to facilitate matching the Control Group.

Control Group. The first step in selection of the Control Group was to investigate all change of major slips filed in the Registrar's Office (see Appendix B). During the first semester of 1962-1963, there were 989 students who filed officially for a change of major. The researcher encountered difficulty in ascertaining classification of students, and therefore it was difficult to tell whether the student had sophomore standing or belonged to another class. The researcher was able to select 204 students who were eligible for the Control Group. This number included all students, regardless of class, who had made academic changes similar to the Experimental Group.

The next step was to match Experimental and Control groups on College Qualification Test scores.

IV. Methods of Comparison

As indicated, students were matched on the basis of college, sex, and College Qualification Test score. In all cases, there was a perfect match in terms of college and sex. In the case of College Qualification Test scores, which were recorded in deciles, the researcher felt that whatever slight variations existed in score would be randomly distributed and cause no particular bias between groups.

Though there was no plan to control for major program, in many cases there were several identical CQT

matches of Control with Experimental Group. When this happened, the researcher utilized the official transcripts to determine hours carried by the student per semester, and course selection. The course of study of the student in the Control Group which came nearest to paralleling that of the student in the Experimental Group was selected for CQT match.

Transcripts of both groups were then checked, to determine academic hours carried by each, though this was not a variable originally considered. It was found that there was an average of no more than six hours difference between total groups. The researcher also checked to make sure that in a given semester no student was carrying less than twelve or more than seventeen academic hours.

Summary

The Student Counseling Bureau was established primarily for the purpose of assisting students in academic and vocational decisions. Though the problems presented to the counseling staff vary widely in nature, a considerable number of students seeks counseling for the purpose of changing academic major and vocational goal.

In this study fifty-four first semester sophomores were arranged in twenty-seven pairs and matched by College Qualification Test score, sex, and college major--the major

from and to which they changed. The Experimental Group sought counseling for the purpose of changing majors; the Control Group did not receive counseling, but made the identical change. The methods employed to select these groups have been described herein. The results of the study are described in the following chapter.

CHAPTER IV

ANALYSIS OF THE DATA

This study was designed to determine whether college students who changed their majors as a result of counseling received through the Student Counseling Bureau improved their grade point averages to a greater degree than those students who changed majors without counseling. The following null hypothesis proposed:

> There is no significant difference between the mean change in grade point average of students who changed their majors subsequent to counseling and the mean change in grade point average of students who changed their majors without assistance provided by a counseling bureau.

The data obtained in the pursuit of this purpose consist essentially of pre-change and post-change grade point averages of the counseled and non-counseled groups. The differences obtained are presented and discussed in this chapter.

As indicated in Chapter III, both the experimental and control groups were matched as equally as possible on the basis of College Qualification Test scores, sex, and

college major--from and to which changes were made. Before discussing the analysis of the research hypothesis, mention will be given to the adequacy of the matched variables.

The matching of subjects on the basis of College Qualification Test scores was not perfect, whereas the factors of sex and college were perfectly matched. The means of the CQT scores in the two groups were compared by use of the F test. The .05 level of significance was set as the criterion level for rejection of the assumptions of matched groups. The results of matching the College Qualification Test scores are presented in Table 1.

TABLE 1

ANALYSIS OF VARIANCE OF COLLEGE QUALIFICATION TEST SCORES OF EXPERIMENTAL AND CONTROL GROUPS

Source of Variation	Sum of Squares	d.f.	Mean Square	F*
Between treatment	0.01850	1	0.01850	0.0025**
Within treatment	380.81	52	7.3234	
Total	380.83	53		

* F of 4.0012 required for significance at the .05 level
**Not significant

The assumption that the mean scores of the groups were equal and did not differ significantly was

substantiated at the .05 level. Therefore, both groups were accepted as homogeneous with respect not only to sex and college change, but also to the variable of College Qualification Test scores.

Statistical Procedures

Differences between the pre-, post-, and final grade point averages of the experimental and control groups were tested by employing the F test. The F test furnishes a comprehensive test of the significance between means. In the case of three or more groups, if F is significant, it is necessary to test each of the mean differences by t. For the testing of two groups, F and t tests are equivalent. However, the F test is a more sensitive test of non-normal population distributions, and was therefore selected.[1]

Due to the exploratory nature of the study, the .05 level of significance was selected. The establishment of this level of significance is consistent with other exploratory studies in which the trend of the results has not been firmly established.

As described in Chapter I, the differences between pre-change and post-change grade point averages were

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1. Allen L. Edwards, Experimental Designs (New York: Holt, Rhinehart and Winston, 1963), p. 132.

computed on course work taken one full academic year before and after changing majors. The results of analysis of difference of grade point averages earned before the change of major are presented in Appendix C. The analysis of difference of grade point averages earned after the change of major are presented in Appendix D. Both pre- and post-change grade point averages were found to be not significantly different between groups at the .05 level.

Results

Analysis of difference of final grade point averages of the two groups were not found to be significantly different at the .05 level, and confirmed that counseling makes little difference, at least in relation to higher grade point averages. Consequently, the null hypothesis could not be rejected.

Table II shows the results of an analysis of variance of the final grade point averages of the experimental and control groups. The results indicate that there was no significant difference in the means of the final grade point averages.

TABLE II

ANALYSIS OF VARIANCE OF CHANGE IN FINAL GRADE POINT AVERAGES OF EXPERIMENTAL AND CONTROL GROUPS

Source of Variation	Sum of Squares	d.f.	Mean Squares	F*
Between treatment	0.56535	1	0.56535	1.3480**
Within treatment	21.809	52	0.41939	
Total	22.374	53		

* F of 4.0012 required for significance at the .05 level
**Not significant

Although not predicted, these findings present some interesting questions concerning the effects of change of academic major as a result of counseling. When a single criterion of effectiveness of counseling for change in major is employed: i.e., gain in grade point average, it must be concluded in this study that counseling does not appear to produce the gain that might have been anticipated. Why this is so is not wholly clear from the data, but it is reasonable to conjecture that with a larger N this might not have been the case, due to trends indicated below.

There are many factors in counseling which are difficult to measure, and to define. Grade point average is only one of many criteria which may be used to measure

success in college. Grades may not indicate personal satisfaction or involvement in a new course of study. Nor do they indicate specific behavior changes on the part of the student.

This study did not seek to determine differences between students who seek counseling, and those who do not. The experimental and control groups in this study differed in that one group volunteered for and participated in counseling, while the other did not. There is the possibility that members of the control group may have received counseling or advice, the nature of which is unknown to the researcher.

Another variable difficult to measure is motivation. This study made no attempt to control for motivation: i.e., motivation to seek counseling, or for academic achievement.

There may be other factors to consider for matching, such as the number of interviews a counselee has with a counselor, which may very well influence results, or the means by which assignment of a counselor to a counselee is determined.

Non-Statistical Findings

Though it appears quite clear from the analysis above that counseling as a basis for change of major did

not produce a statistically significant gain in grade point average in this case, some further inspection of the data may be of interest. Data related to nature of pre-change and post-change grade point averages, and the amount of gain or loss for the experimental and control groups are presented in Table III.

As can be noted in Table III, fifteen of the twenty-seven students in the experimental group registered a gain of one-fourth of a grade point or more after changing majors, as against eleven in the control group, a difference of four in favor of the counseled students. While this difference in number of students gaining has not been subjected to a test of statistical significance, the fact that more counseled students did gain, even though the mean gain is not statistically significant, would suggest that counseling may indeed "pay off" in terms of grade point averages as earned by individual students.

The mean gain in grade point average for the experimental (counseled) students was .694, as against a control (non-counseled) gain of .598. While this difference of .096 does not appear large in terms of the maximum possible grade point average, for many it could mean literally the difference between graduating or not graduating, or being eligible for transfer into a professional college (e.g., from Liberal Arts to Education,

TABLE III

SEX, COLLEGE CHANGE, CQT DECILE, PRE- AND POST- POINT AVERAGES AND GRADE POINT AVERAGE GAIN OR LOSS OF CONTROL AND EXPERIMENTAL SUBJECTS

Case No.	Sex	College Change	CQT*	Pre-Change GPA	Post-Change GPA	Gain or Loss	CQT*	Pre-Change GPA	Post-Change GPA	Final GPA
1	M	Engr to BPA	6	3.2174	2.3478	0.8696++	5	3.6000	3.0681	0.5319++
2	M	Engr to LA	10	2.1404	2.2000	-0.0596[1]	10	1.7451	1.9853	-0.2132
3	M	LA to BPA	2	3.2976	3.1111	0.1865	2	2.8837	2.7021	0.1816
4	F	Educ to HE	2	4.6667	3.2692	1.3975++[2]	4	2.7750	3.3571	-0.5821
5	M	LA to BPA	3	3.2105	2.7837	0.4268+[3]	3	2.3673	2.0392	0.3281+
6	M	Engr to BPA	7	3.1923	2.7708	0.4215+	7	3.5652	4.5238	-0.9586
7	M	BPA to LA	9	1.5800	1.7173	-0.1373	9	1.2813	1.2340	0.0473
8	F	FA to HE	7	2.0833	1.7000	0.3833+	7	3.5000	2.8780	0.6220++
9	M	LA to Educ	10	2.2045	2.2500	-0.0455	10	1.6862	1.4237	0.2625+
10	F	BPA to HE	4	4.2222	2.5957	1.6265++	4	2.5306	2.2592	0.2714+
11	M	Engr to LA	10	1.2667	1.6415	-0.3748	10	2.4634	2.5000	-0.0366
12	M	LA to Educ	9	2.7143	2.9555	-0.2412	9	1.9429	2.0000	-0.0571
13	M	La to BPA	2	2.8889	1.8684	1.0205++	2	2.5778	2.9047	-0.3269
14	M	Engr to Agr	9	2.6522	3.0000	-0.3478	5	3.2692	3.6458	-0.3766
15	M	Min to BPA	10	2.5217	2.2000	0.3217+	9	3.7500	3.5789	0.1711
16	M	LA to Agr	7	4.1404	2.7659	1.3745++	6	3.2105	3.4054	-0.1949
17	F	BPA to LA	4	2.7115	4.4210	-0.7095	8	1.2708	1.1509	0.1199
18	M	FA to BPA	7	3.3409	2.5531	0.7878	5	2.4130	3.7906	-1.3776
19	M	LA to BPA	9	2.2449	2.9130	-0.6681	9	2.9487	3.0476	-0.0989
20	M	Engr to LA	5	2.4634	2.7500	-0.2866	8	3.7755	3.5588	0.2067
21	F	FA to Educ	10	2.5333	2.7352	-0.2019	9	2.4666	2.1923	0.2743+
22	M	LA to Phar	2	2.6200	2.1960	0.4240+	3	3.1875	2.9500	0.2675+
23	M	LA to FA	8	3.4459	2.8852	0.5607++	7	4.2963	4.7058	-0.4093
24	M	LA to Agr	8	2.9362	2.5490	0.3872+	6	3.6878	2.7000	0.9878++
25	M	BPA to Educ	5	3.2593	2.8181	0.4412+	6	3.8297	2.7446	1.0851++
26	M	FA to LA	8	3.8250	2.5937	1.2313++	10	3.8205	2.6875	1.1330++
27	M	LA to Educ	9	2.8800	2.7631	0.1169	8	3.0000	2.4583	0.5417+

*College Qualification Test scores are given in deciles

1. Loss is shown by a minus.
2. Gain of more than half a point in GPA is shown by ++.
3. Gain of more than a fourth of a point in GPA is shown by +.

where a 3.0000 grade point average or better is required).

The mean loss in grade point average for the experimental (counseled) students was .407 as against a control (non-counseled) loss of .421.

Summary

Analysis of the data was presented in this chapter. Experimental and control groups were matched according to sex, College Qualification Test scores, and college major. Pre-counseling grade point averages of the experimental and control groups were comparable. The results of the study indicated that there was no statistically significant difference between the groups, and suggested that counseling makes little difference in relation to increasing grade point averages. There is, however, a trend toward individual gain in grade point averages within the experimantal, or counseled group.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Selecting a major course of study is a primary task for most college students; one which involves the whole spectrum of social, personal, and performance expectations, and in which the total personality is inevitably involved. Research in this area indicates that electing a course of study which suits a student's interests, abilities, and vocational designs is of paramount importance in achieving academic success.

Summary

When a student selects a major field, and subsequently discovers that he cannot or does not wish to continue in the initial selection, problems of change become both personal and administrative. Students certainly are faced with the question of "change to what?" and on what basis.

Students who change majors have been the concern of many educators, but very little research has been forthcoming as to the reasons for change. Therefore, educators are not sure how or why changes occur, but some attribute

change of major to the students' lack of academic success, family and peer influence, lack of knowledge about curricula and goal expectation, or lack of adequate information about themselves.

Most studies related to change of major, or of degree objective, give indication that from 40 to 70 percent of college graduates throughout the nation changed majors at least once during their period of study. With the increasing number of students attending college, the problem of assisting students to find their particular niche, one in which they will find success in college and in later life, has not diminished.

Many students seek counseling for the purpose of exploring educational and vocational opportunities, and for assistance in selecting a new field of study. This research project was designed to consider the questions: Do students who change college majors improve their grade point averages as a result of counseling? Is such a change significantly greater than that of students changing without benefit of formal counseling services?

In order to answer these questions, the following null hypothesis was tested:

> There is no significant difference between the mean change in grade point average of students who change their majors subsequent to counseling (College Counseling Bureau) and the mean change

in grade point average of students who change their majors without assistance provided by a Counseling Bureau.

The subjects of the study were selected from data supplied by the Registrar's Office, the Special Projects Office and the Student Counseling Bureau files. The subjects finally drawn for this study were fifty-four University of Arizona students who changed their academic majors during the first semester of their sophomore year in 1962-1963, and attained senior standing in 1964-1965. These students were arranged in twenty-seven matched pairs, each pair consisting of one counseled sophomore and one non-counseled sophomore. The two groups, designated as the Experimental (counseled) and Control (non-counseled) were matched as evenly as possible on the basis of College Qualification Test scores, sex, and college major--the major from and to which they changed.

Conclusions

A one-way analysis of variance was computed to determine the differences in gain or loss in the grade point averages of the Experimental and Control groups. The analyses of variance obtained were not sufficient to reject the null form of the hypothesis at the .05 level of significance. It must be concluded that counseling, in this

study, does not appear to produce the gain that might have been anticipated. However, there was a trend in the direction of higher grade point averages in the counseled group, even though the group difference in mean gain was not statiscally significant.

This may suggest that counseling has merit for individual students in relation to higher grade point averages, but the general effect is negligible. The narrowness of the grade point average as an adequate criterion of counseling, the inability to control some variables, and other possible reasons for this lack of gain in the criterion measure needs to be considered.

Recommendations

There are many factors in counseling which are difficult to measure or to define. The results of this study give insight into only one criterion of measuring success in college, or the success of counseling. Due to the exploratory nature of the study, no reports of previous study which might have been used as a basis of comparison were found. Duplication of the study and extension of the settings is warranted before results should be considered absolute.

Grade point average is only one of many criteria which may be used to measure success in college. Grades

may not indicate personal satisfaction or involvement in a new course of study. Nor do they indicate specific behavior changed on the part of the student. Subsequent study should take these criteria into account along with grade point average.

It should be mentioned here that some variables were excluded due to the limiting nature of the study.

This study did not seek to explore differences between students who sought counseling and those who did not. It is possible that a person who seeks counseling may be different from one who does not. This is a question which still remains unanswered by empirical data.

Another variable difficult to measure is motivation. This study made no attempt to control for motivation: i.e., motivation to seek counseling, or for academic achievement.

There are many factors which influence the student's decision to choose or change his degree objective. At the present time there is more conjecture than empirical evidence as to the "why" of change of majors, or degree objective. Further research seeking solutions to the problems in this broad area is likely to benefit both students and administrators.

APPENDIX

APPENDIX A

INFORMATION INVENTORY

Group I Experimental No.___

Matric No._____ Sex_____ Age_____ CQT Scores_____ Date_____

Folder No._____ College_____ Major_____ Pre-GPA_____

College Change_____ Major Change_____ Post-GPA____

Comments_____

_____

. . . . . .

Group II Control No.___

Matric No._____ Sex_____ Age_____ CQT Scores_____ Date_____

College_____ Major_____ Pre-GPA_____

College Change_____ Change Major_____ Post-GPA_____

Comments_____

_____

APPENDIX B

UNIVERSITY OF ARIZONA CHANGE OF COLLEGE

Name_____
Last First Middle Matric No. Date

CHANGE TO BE EFFECTIVE Sept 19___ Jan 19___ June 19___
July 19___

Transfer to:_____ Approved Denied
College or School

Transfer from:_____
College or School Date of last UA reg.

Print Name_____ Do not write here
First Middle Last

Deficiencies:

_____
Number Street

_____
City State

APPENDIX C

TABLE II

ANALYSIS OF VARIANCE OF PRE-CHANGE GRADE POINT AVERAGES OF EXPERIMENTAL AND CONTROL GROUPS

Source of Variation	Sum of Squares	d.f.	Mean Square	F*
Between treatment	0.00319	1	0.00319	0.0050**
Within treatment	33.109	52	0.63671	
Total	33.112	53		

* F of 4.0012 required for significance at the .05 level

**Not significant

APPENDIX D

TABLE III

ANALYSIS OF VARIANCE OF POST-CHANGE GRADE POINT AVERAGES OF EXPERIMENTAL AND CONTROL GROUPS

Source of Variation	Sum of Squares	d.f.	Mean Square	F*
Between treatment	0.48364	1	0.48364	0.8781**
Within treatment	28.641	52	0.55079	
Total	29.125	53		

* F of 4.0012 required for significance at the .05 level

**Not significant

SELECTED BIBLIOGRAPHY

Campbell, D. P., "Achievements of Counseled and Non-Counseled Students Twenty-Five Years After Counseling," Journal of Counseling Psychology, 12, 287-293, No. 3, 1965.

Dunn, F. E., "Two Methods of Predicting the Selection of a College Major," Journal of Counseling Psychology, 6, 15-25, No. 1, 1959.

Edwards, Allen L. Experimental Designs. New York: Holt Rhinehart and Winston, 1963. 392pp.

Faries, M., "Short-term Counseling at the College Level," Journal of Counseling Psychology, 2, 182-183, NO. 3, 1955.

French, J. W., "Aptitude and Interest Score Patterns Related to Satisfaction with College Major Field," Educational and Psychological Measurement, 21:287-294, 1961.

Fryer, Douglas. Measurement of Interests. New York: Henry Holt and Company, 1931. 369pp.

Gamble, G. W. "Pre-College Experience and Curricular Changes by College Students," Personnel and Guidance Journal, 40:561-564, 1962.

James, Newton. Annual Report of the University of Arizona Student Counseling Bureau, Tucson, Arizona, 1965.

Klingelhofer, E. L., "The Relationship of Academic Advisement to the Scholastic Performance of Failing College Students," Journal of Counseling Psychology, 1:125-131, No. 3, 1954.

Magoon, T. M., Hoyt, D. P., Volsky, T., and Norman, W. T., "Research in Counseling and Case Work: Theory, Methodology, and Outcomes," Counseling Bureau Report, University of Minnesota, 1957. (Mimeographed)

Norton, E. D., "An Investigation of Interest, Aptitude, and Performance Measures as they Relate to Degree Objective - Changing Behavior of Selected Counselees," Unpublished Ph.D Dissertation, Purdue University, 1963.

Pierson, R. R., "Changes of Majors by University Students," Personnel and Guidance Journal, 40:458-461, 1962.

Rudikoff, L. C., and Kirk, B. A., "Goals of Counseling: Mobilizing the Counselee," Journal of Counseling Psychology, 8:243-249, 1961.

Shepherd, R. E., "The Relation of Counseling and Student Problems to Graduation," Journal of Counseling Psychology, 12:No. 3, 244-247, 1965.

State University of Iowa, Office of the Registrar, Bulletin No. 4, "The Scholastic Achievement of Students entering the College of Liberal Arts in September, 1949," Student Personnel Service Publication, Iowa City, January, 1951.

Toven, J. R., "Appraising a Counseling Program at the College Level," Occupations, 23:459-466, 1945.

University of Arizona Biennial Catalogue, Vol. LVIII, No. 3, June 1965.