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# Adaptation of the theory of work adjustment to the graduates of the engineering cooperative education program at Iowa State University

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Adaptation of the theory of work adjustment to  
the graduates of the engineering cooperative  
education program at Iowa State University

by

Charles William Jones

A Dissertation Submitted to the  
Graduate Faculty in Partial Fulfillment of  
The Requirements for the Degree of  
DOCTOR OF PHILOSOPHY

Major: Education (Guidance and Counseling)

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Signature was redacted for privacy.

In Charge of Major Work

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For the Graduate College

Iowa State University  
Ames, Iowa

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## TABLE OF CONTENTS

	Page
INTRODUCTION	1
REVIEW OF LITERATURE	12
PROCEDURE	28
FINDINGS	36
DISCUSSION	52
SUMMARY	65
BIBLIOGRAPHY	70
ACKNOWLEDGMENTS	72
APPENDIX A: QUESTIONNAIRE	73
APPENDIX B: LETTERS	76
APPENDIX C: EDWARDS DEFINITIONS OF NEEDS	80
APPENDIX D: CORRELATION MATRIX	84

## INTRODUCTION

During the last half century, many theorists have concerned themselves with the decision making process involved in occupational choices of individuals at all levels. Some of these theories deal with the adjustment of individuals to the specific occupation they have chosen. One such theory has been proposed by Dawis, Lofquist and Weiss in 1968 and is known as The Theory of Work Adjustment. This theory is based on the principle that an individual seeks to achieve and maintain correspondence with his Work-environment. The following is a list of the propositions and corollaries that make up that Theory of Work Adjustment (Dawis et al., 1968, p. 9):

Proposition I. An individual's work adjustment at any point in time is indicated by his concurrent levels of satisfactoriness and satisfaction.

Proposition II. Satisfactoriness is a function of the correspondence between an individual's abilities and the ability requirements of the work environment, provided that the individual's needs correspond with the reinforcer system of the work environment.

Corollary II a. Knowledge of an individual's abilities and of his satisfactoriness permits the determination of the effective ability requirements of the work environment.

Corollary II b. Knowledge of the ability requirements of the work environment of an individual's satisfactoriness permits the inference of an individual's abilities.

Proposition III. Satisfaction is a function of the correspondence between the reinforcer system of the work environment and the individual's needs, provided that the individual's abilities correspond with the ability requirements of the work environment.

Corollary III a. Knowledge of an individual's needs and of his satisfaction permits the determination of the effective reinforcer system of the work environment for the individual.

Corollary III b. Knowledge of the reinforcer system of the work environment and of an individual's satisfaction permits the inference of an individual's needs.

Proposition IV. Satisfaction moderates the functional relationship between satisfactoriness and ability-requirement correspondence.

Proposition V. Satisfactoriness moderates the functional relationship between satisfaction and need-reinforcer correspondence.

Proposition VI. The probability of an individual being forced out of the work environment is inversely related to his satisfactoriness.

Proposition VII. The probability of an individual voluntarily leaving the work environment is inversely related to his satisfaction.

Combining Propositions VI and VII, we have:

Proposition VIII. Tenure is a joint function of satisfactoriness and satisfaction.

Given Propositions II, III and VIII, this Corollary follows:

Corollary VIII a. Tenure is a function of ability-requirement and need-reinforcer correspondence.

Proposition IX. Work-personality-work environment correspondence increase as a function of tenure.

Figure 1 is a graphical representation of the Theory of Work Adjustment.

The Theory of Work Adjustment includes two factors that have proved to be very useful to vocational counselors, these factors are satisfactoriness and satisfaction. These terms are defined in the theory as follows:



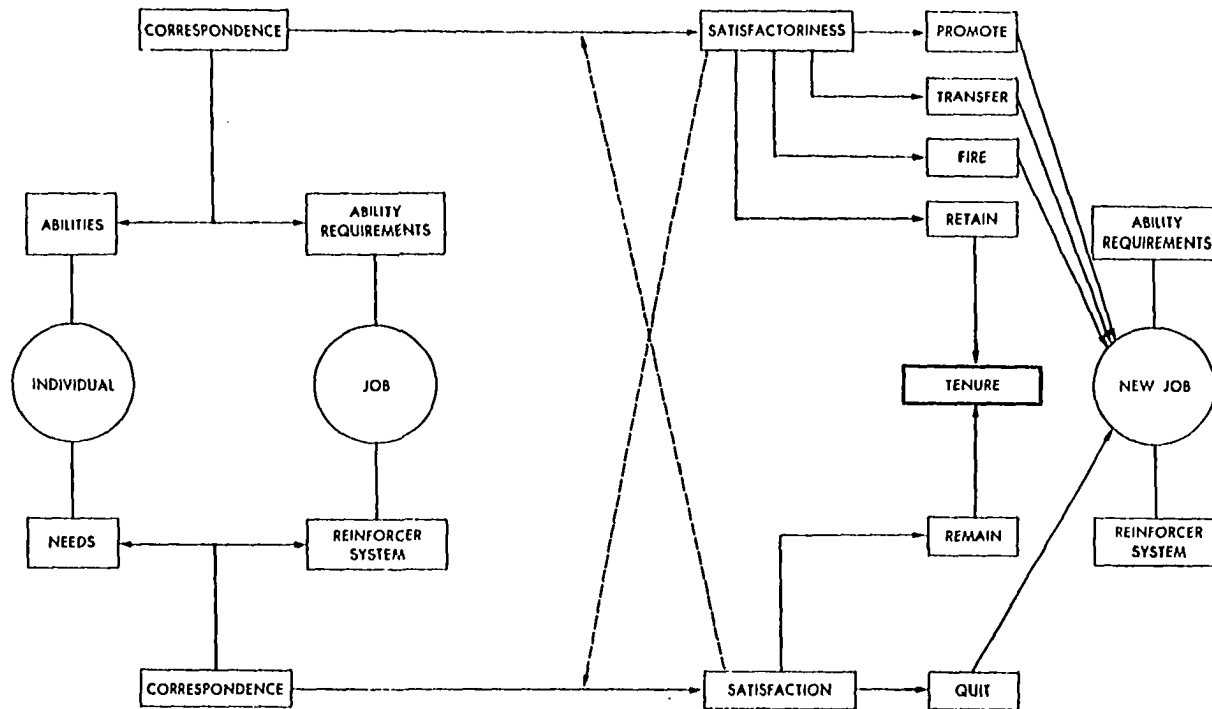


Figure 1. Work adjustment model (Dawis et al., 1968, p. 12)

"Satisfactoriness and satisfaction indicate the correspondence between the individual and his work environment. Satisfactoriness and satisfaction, then, are basic indicators of the degree of success and individual has achieved in maintaining correspondence between himself and his work environment.

Satisfactoriness is an external indicator of correspondence, i.e., it is derived or obtained from sources other than the individual worker's own appraisal of his fulfillment of the requirements of the work environment. Satisfaction is an internal indicator of correspondence, i.e., it represents the individual worker's appraisal of the extent to which the work environment fulfills his requirements." (Dawis et al., 1968, p. 5)

According to the Theory, if both of these requirements, satisfactoriness and satisfaction, are fulfilled for an individual, he and his environment are correspondent.

An academic program is very much like a job in that it too can be described as having ability requirements and need-reinforcers. A student must adjust to and interact effectively with his study environment if he expects to persist and eventually graduate. Therefore, it seems feasible to assume that the Theory of Work Adjustment could be used in investigations concerning the adjustment of college students to their environment. This assumption was investigated by Starr, Betz and Menne at Iowa State University in 1971. The sample for this investigation consisted of randomly selected students who enrolled as freshmen during the school year 1968-69 at Iowa State University. The findings of this investigation gave support to the extension of the Dawis, Lofquist and Weiss Theory of Work Adjustment to the study of college student

adjustment. Research has also been conducted to develop new instruments and test existing instruments for measuring abilities and needs within the framework of the Theory of Work Adjustment. Results of such research projects have provided counselors with better tools to use in dealing with counselees who are in the process of investigating occupational choice.

The Starr, Betz and Menne (1972) study has shown the Theory of Work Adjustment to be a valid framework for the investigation of college students and their environment. These findings have opened the way for countless future studies dealing with college students and their environment. The Theory, therefore, could be stated in the following manner in its adaptation to the college student and his environment:

Proposition I. A college student's academic adjustment at any point in time is indicated by his concurrent levels of satisfactoriness and satisfaction.

Proposition II. Satisfactoriness is a function of the correspondence between a student's abilities and the ability requirements of his academic program, provided that the student's needs correspond with the reinforced system of the academic environment.

Corollary II a. Knowledge of a student's abilities and of his satisfactoriness permits the determination of the effective ability requirements of the academic program.

Corollary II b. Knowledge of the ability requirements of the academic program and of a student's satisfactoriness permits the inference of a student's abilities.

Proposition III. Satisfaction is a function of the correspondence between the reinforcer system of the academic environment and the student's needs, provided that the student's abilities correspond with the ability requirements of the academic program.

Corollary III a. Knowledge of a student's needs and of his satisfaction permits the determination of the effective reinforcer system of the academic environment for the student.

Corollary III b. Knowledge of the reinforcer system of the academic environment and of a student's satisfaction permits the inference of a student's needs.

Proposition IV. Satisfaction moderates the functional relationship between satisfactoriness and ability-requirement correspondence.

Proposition V. Satisfactoriness moderates the functional relationship between satisfaction and need-reinforcer correspondence.

Proposition VI. The probability of a student being forced out of the academic environment is inversely related to his satisfactoriness.

Proposition VII. The probability of a student voluntarily leaving the academic environment is inversely related to his satisfaction.

Combining Proposition VI and VII, we have:

Proposition VIII. Graduation is a joint function of satisfactoriness and satisfaction.

Given Propositions II, III and VIII, this Corollary follows:

Corollary VIII a. Graduation is a function of ability requirements and need-reinforcer correspondence.

#### Purpose of the Study

The main purpose of the present study was to test the use of the adaptation of the Theory of Work Adjustment to investigate a more homogeneous group of college students than the group studied by Starr, Betz and Menne. Proposition I of the

theory states that satisfactoriness and satisfaction are independent measures of adjustment, therefore, this relationship was the first to be tested in this investigation. If the theory works for a homogeneous group of college students, then a look at graduates of an academic program should permit an accurate description of the effective ability-requirements and the need-reinforcers of that program. Information of this type would prove extremely useful in counseling students who are investigating various academic fields of study. Corollary II a of the adaptation of the Theory states; "Knowledge of a student's abilities and of his satisfactoriness permits the determination of the effective ability-requirements of the academic program." The second part of this study investigated this Corollary as well as Proposition II. The third part of the study dealt with Corollary IIIa and Proposition III and investigated students' needs and their satisfaction with college. The sample for the study was drawn from graduates of the Engineering Cooperative Education Program at Iowa State University. This group was selected because commonly used ability test data were available for many of the graduates as well as one test measuring needs. The measure of satisfactoriness was available on all of the graduates in the form of their Grade Point Average (GPA) at the time of graduation. Since no measure of satisfaction was available for these graduates, a questionnaire was designed and a copy mailed to each graduate

to obtain this information. The available data for investigation included the High School Average (HSR), scores on the American College Test (ACT), the Otis Quick-Scoring Mental Ability Test, the Minnesota Scholastic Ability Test, the Edwards Personal Preference Schedule, the Grade Point Average and a Stated Satisfaction with College. The questionnaire provided a means of collecting additional follow-up information including his job history since graduation. Hoppock's Job Satisfaction Blank Number 5 was included as a part of the questionnaire to obtain a measure of satisfaction with his current job. This additional information made it possible to extend the study beyond graduation to determine whether or not there was a relationship between job satisfaction and the measures under investigation.

#### Objectives of the Study

1. To determine whether or not the measure of satisfactoriness (GPA) and the measure of satisfaction with college (scale on the questionnaire) are independent measures.
2. To determine whether or not the measures under investigation (High School Rank, American College Test, Otis, Minnesota Scholastic Aptitude Test) can be used as measures of correspondence of satisfactoriness for graduates of the Engineering Cooperative Education Program at Iowa State University.

3. To determine whether or not the Edwards Personal Preference Schedule can be used as a measure of correspondence of satisfaction with college for graduates of the Engineering Cooperative Education Program at Iowa State University.

4. To describe the Ability-Requirements of the Engineering Cooperative Education Program at Iowa State University.

5. To describe the Need-Reinforcers of the Engineering Cooperative Education Program at Iowa State University.

6. To determine whether or not the measures under investigation are predictors of Job Satisfaction of graduates of the Engineering Cooperative Education Program as measured by Hoppock's Job Satisfaction Blank Number 5.

#### Hypotheses to be tested

- $H_{01}$  : There is no significant relationship between measures of satisfactoriness (GPA) and satisfaction with college (scale on the questionnaire).
- $H_{02}$  : There is no significant relationship between Final Grade Point Average (Satisfactoriness) of graduates of the Engineering Cooperative Education Program and High School Rank.
- $H_{03}$  : There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and scores on the American College Test.
- $H_{04}$  : There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and scores on the Otis Quick-Scoring Mental Ability Test.

- H<sub>0</sub>5 : There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and scores on the Minnesota Scholastic Aptitude Test.
- H<sub>0</sub>6 : There is no significant relationship between Stated Satisfaction with college for graduates of the Engineering Cooperative Educational Program and Needs as measured by the Edwards Personal Preference Schedule.
- H<sub>0</sub>7 : There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and High School Rank.
- H<sub>0</sub>8 : There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and Scores on the American College Test.
- H<sub>0</sub>9 : There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and scores on the Otis Quick-Scoring Mental Ability Test.
- H<sub>0</sub>10 : There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and Scores on the Minnesota Scholastic Aptitude Test.
- H<sub>0</sub>11 : There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and Needs as measured by the Edwards Personal Preference Schedule.

#### Assumptions

The following assumptions have been made in this study:

- (1) Grade Point Average can be considered a measure of level



of satisfactoriness, (2) a level of satisfaction with college can be effectively measured by the graduate stating his satisfaction on the scale provided on the questionnaire, and (3) ability requirements are the same for all students in the Cooperative Education Program.

#### Limitations of the Study

The first three propositions of the adaptation of the theory provided the framework that was to be tested in this study. The first five objectives of this study were related to the first three propositions. For this reason, only the first three propositions of the adaptation of the theory have been tested in this investigation. The sixth objective was not directly related to any of the propositions of the adapted theory, however, it did provide an opportunity to investigate the usefulness of the tests in question and their relationship to long range planning.

#### The Engineering Cooperative Education Program

The Engineering Cooperative Education Program at Iowa State University is an educational plan that combines classroom learning with on-the-job engineering experience in private industry and governmental agencies. A student in this program must complete the same requirements for the bachelor's degree as a regular engineering student while acquiring 12 to 21 months

of work experience. The completion of this program requires only one year more than the usual bachelor of science degree program.

## REVIEW OF LITERATURE

For the purposes of clarity the review of literature has been organized to include readings and studies from the areas of (1) theories of occupational choice, (2) studies of prediction using intellectual factors and non-intellectual factors and (3) studies that relate to the present study. The literature in these various fields is very extensive, however, only studies that provide proper background and those that are pertinent to the present investigation have been included.

## Theories of Occupational Choice

As education became available to more and more people in the United States of America, it became apparent that certain problems were arising that teachers were not equipped to handle. One such problem was the need for vocational counseling. According to Beck (1963), and other writers in the field of guidance, the publication of a book by a social worker, Frank Parsons, marked the beginning of the vocational movement in this country. The book was intended to aid those persons who were attempting to counsel students in planning their futures. Parson's book also provided a rationale for vocational guidance in its formative years. In this publication, Frank Parsons (1909), explained his theory and method as follows:

"In the wise choice of a vocation there are three broad factors: (1) a clear understanding of yourself, your aptitude, abilities, interests, ambitions, resources,

limitations, and their causes; (2) a knowledge of the requirements and conditions of success, advantages and disadvantages, compensation, opportunities, and prospects in different lines of work; (3) true reasoning on the relations of these two groups of facts." (Parsons, 1909, p. 5)

This method has been referred to as the Parsons method of counseling students with vocational needs. Beck (1963) has summarized the method as a three-step method consisting of: (1) know the student; (2) know the world of work; and (3) match the man with the job. The method that Parsons proposed appeared to be both logical and workable but it soon bogged down. Parsons and his followers found that it was not enough to use general impressions and logic alone when counseling with students concerning their vocational choices. They soon became aware that their observations of individuals needed to be made in a more objective manner. Since psychological instruments and techniques needed to study individuals were almost non-existent, the method met with little real success. Parsons had, therefore, demonstrated a real need for instruments that would measure the various traits of individuals in order to better, "know the student". Some work was being done with intelligence tests at the time, however, Parson's method brought about a trend that led to the development of tests that would measure other traits. This was probably the most significant development in the field of guidance up to the 1930's. The trait-factor approach, or matching man to the occupation, brought about the development of such instruments as the Strong

Vocational Blank, the Kuder Preference Record, the Differential Aptitude Test and many other tests that are used to measure interests, aptitudes, abilities, personality, values, and etc. The trait-factor approach is probably the oldest approach to theories of occupational choice. Other contributors in this field during the 1920's were people like Kinston (1925) and Hull (1928).

Some theories have taken a more sociological approach to the theory of occupational choice. These theories have as their central point the notion that circumstances beyond the control of the individual contribute to the career choices he makes. Examples of the sociological approach can be found in the writings of Caplow (1954), Hollingshead (1949) and Miller and Form (1951).

A third approach to theories of occupational choice has been referred to as a personality approach. The general theme of these theories is that workers select their jobs because they see potential for the satisfaction of their needs. Another hypothesis of this approach is that exposure to a job gradually modifies the personality of the worker so that eventually the workers in a given job become like one another, if they were not already like one another when they entered the job. Theories of this type vary from detailed description of personality types and stereotypes as described by Holland (1959) to studies such as those conducted by Roe (1957).

Hoppock (1957) advanced such a theory of vocational choice consisting of an elaborate list of needs that he saw as being inherent in the process of making such a choice. This theory consists of ten postulates and will be stated here to describe more completely theories of this type.

1. Occupations are chosen to meet needs.
2. The occupation that we choose is the one that we believe will best meet the needs that most concern us.
3. Needs may be intellectually perceived, or they may be only vaguely felt as attractions which draw us in certain directions. In either case, they may influence choice.
4. Occupational choice begins when we first become aware that an occupation can help to meet our needs.
5. Occupational choice improves as we become better able to anticipate how well a prospective occupation will meet our needs. Our capacity thus to anticipate depends upon our knowledge of ourselves, our knowledge of occupations, and our ability to think clearly.
6. Information about ourselves affects occupational choice by helping us to recognize what we want, and by helping us to anticipate whether or not we will be successful in collecting what the contemplated occupation offers to us.
7. Information about occupations affects occupational choice by helping us to discover the occupations that may meet our needs, and by helping us to anticipate how well satisfied we may hope to be in one occupation as compared with another.
8. Job satisfaction depends upon the extent to which the job that we hold meets the needs that we feel it should meet. The degree of satisfaction is determined by the ratio between what we have and what we want.
9. Satisfaction can result from a job which meets our needs today, or from a job which promises to meet them in the future.

10. Occupational choice is always subject to change when we believe that a change will better meet our needs. (Hoppock, 1957, p. 74)

Hoppock's theory describes quite well the personality approach and one can see by the ten postulates that it attempts to cover all aspects of career development.

Osipow (1968) refers to another group of theories as the self-concept approach to theories of occupational choice. In this group he includes such theorists as Buehler, Ginzberg, Samler and Super. Osipow goes on to say: "The approach holds as its central theses that (1) individuals develop more clearly defined self-concepts as they grow older, although these vary to conform with the changes in one's view of reality as correlated with aging; (2) people develop images of the occupational world which they compare with their self-image in trying to make career decisions; and (3) the adequacy of the eventual career decision is based on the similarity between an individual's self-concept and the vocational concept of the career he eventually chooses." (Osipow, 1968, p. 11). Samler (1953) has proposed a series of postulates which relate vocational choice to the counseling process and a complete list of these relationships can be found in the source referred to here. Ginzberg, Ginsburg, Axelrad, and Herma (1951) conducted a study that included students from the sixth grade up through graduate school. These authors concluded from this study that effective vocational choice was based upon the ability of the

individual to understand his own values and goals. They also stated that individuals go through three stages in the vocational choice process. They referred to these stages as (1) the fantasy stage, (2) the tentative stage, and (3) the realistic stage. Ginzberg et al., described the first two stages as periods in which the individual is making preliminary choices on a highly subjective basis. It is during these early stages that the individual does a good deal of thinking about what he would like to do i.e. a "daydream" type of approach. During late adolescence he begins to recognize that his values and goals, as well as the range of opportunities, will have a great deal to do with what he eventually does with his life. It is during this realistic stage that the individual begins the process of compromise. The compromise is between what he can do and would like to do on the one hand, and the opportunities that exist on the other hand, with his goals and values expressing themselves in arriving at the compromise. Super (1953) constructed his theory of vocational development which reflects some of the same type of thinking as reported by Ginzberg et al. Some similarities can also be seen between Hoppock's theory and Super's theory. However, since there are some differences in these two theories, Super's theory will be presented here by listing the ten propositions that describe the theory.



## Super's Theory of Vocational Development

1. People differ in abilities, interests and personalities.
2. Individuals are qualified, by virtue of these characteristics, each for a number of occupations.
3. Each of these occupations requires a characteristic pattern of abilities, interests, and personality traits, with tolerance wide enough, however, to allow both some variety of occupations for each individual and some variety of individuals in each occupation.
4. Vocational preferences and competencies, the situations in which people live and work, and hence their self-concepts, change with time and experience, making choice and adjustment a continuous process.
5. This process may be summed up in a series of life stages characterized as those of growth, exploration, establishment, maintenance, and decline, and these stages may in turn be subdivided into (a) the fantasy, tentative, and realistic phases of the exploratory stage, and (b) the trial and stable phases of the establishment stage.
6. The nature of the career pattern is determined by the individual's parental socio-economic level, mental ability, and personality characteristics, and by the opportunities to which he is exposed.
7. Development through the life stages can be guided, partly by facilitating the process of maturation of abilities and interests and partly by aiding in reality testing and in the development of the self-concept.
8. The process of vocational development is essentially that of developing and implementing a self-concept: it is a compromise process in which the self-concept is a product of the interaction of inherited aptitudes, neural and endocrine make-up, opportunity to play various roles, and evaluations of the extent to which the results of role-playing meet the approval of superiors and fellows.

9. The process of compromise between individual and social factors, between self-concept and reality, is one of role-playing, whether the role is played in fantasy, in the counseling interview, or in real-life activities such as school classes, clubs, part-time work, and entry jobs.
10. Work satisfactions and life satisfactions depend upon the extent to which the individual finds adequate outlets for his abilities, interests, personality traits, and values; they depend upon his establishment in a type of work, a work situation, and a way of life in which he can play the kind of role which his growth and exploration experiences have led him to consider congenial and appropriate. (Super, 1953, p. 185).

This was Super's theory as he originally stated it in 1953.

The theory remained unchanged until about 1963 when Super and his associates started to make revisions and it has since become a more useable theory both for practice and research purposes.

Only a few theories have been presented here, but they are representative of the various approaches that have been taken to explain vocational choice and some of the determinants. Much can be learned from each of the various approaches and theories of vocational choice. While none of the theories give the counselor all of the tools he needs in dealing with students and their career choices, a study of the various theories does provide him with the background knowledge he needs to better understand the student and the choices he is attempting to make.

Much research has been generated by these theories and some of the research has produced ways and means of implementing the theories in the counseling process. Some investigations

have provided information relating personality characteristics of workers to occupational specifications. Two examples of this type of research are: (1) the Worker Trait Requirements for 4000 Jobs (U.S. Department of Labor, 1956), and (2) the Dictionary of Occupational Titles (U.S. Department of Labor, 1965). While these tools are widely used in the field of counseling, the data included in them are not empirical data. The data reported are expert estimates of the average levels of attainment on the most relevant abilities, plus estimates of the level and length of education required, and the level and type of physical demands. Expert estimates may provide a fuller coverage of the abilities and other traits associated with occupations but the validity of such estimates is rather questionable.

One theory that has been proposed and tested in a number of studies is the Theory of Work Adjustment (Dawis et al., 1968). This theory has been described in the introduction of this theses. It not only gives a theoretical framework for understanding and studying the individual and his work environment, but it provides a model for implementing the findings of any research that uses as its design the framework of the theory. While this theory was developed and tested on the working population it has implications for use in the school counseling setting. Lofquist and Dawis (1969) in their explanation of the uses of the theory of work adjustment in

counseling stated:

"The vocational counselor in the school setting may be immediately concerned with the prediction of success in educational and training programs. He also will be working with younger counselees whose work personalities may not have reached a stable stage of development. Therefore, in addition to the knowledge and techniques required for carrying out the basic counseling procedures, he should have specialized knowledge of psychological tests and other assessment devices for the age group with which he is working. He must also be well informed about the requirements and reinforcements in educational and training environments. However, it must be emphasized that, while measures of success in educational and training programs are important intermediate criteria, their long-range significance lies in their relevance to the more fundamental criteria of work adjustment. Similar considerations would be appropriate for vocational counseling carried out in a college setting." (Lofquist and Dawis, 1969, p. 99)

### Prediction Studies

#### Intellectual factors

The literature contains numerous reports of studies dealing with the prediction of college success. Research projects of this type grew quite naturally out of the mass testing movement and the increasing number of individuals making application for admission to our colleges and universities. Since the number of applicants many times was greater than the number that could be accommodated by these institutions, a need for some sort of selection process was evident. This need plus the availability of large quantities of intellectual test data resulted in the numerous prediction studies. The prediction equations that were developed in this

manner were mainly used for the purposes of selecting and admitting students to colleges and universities. While predictions of this type were not perfect, they were considered to be useful and were widely accepted by admissions offices throughout the United States.

Prediction studies of the type mentioned made use of correlation and regression techniques. The intellectual factors used in these studies were mainly the high school average or rank and some combination of entrance examination scores. These factors were then correlated with academic performance such as the first quarter or first year grade point average. The best predictors were then selected and combined to make a multiple regression equation. While many critics of this approach were stating that it was impersonal, Meehl (1954) showed that the multiple correlations approach generally produced better prediction of grade point averages than subjective evaluations of trained personnel using the same data plus a personal interview.

Fishman and Pasanella (1960) reviewed the literature concerning prediction studies and found 580 such studies were conducted in the 1950's. Nearly 70 percent of the studies made use of intellectual factors in the prediction of academic success. They reported many shortcomings of the prediction approach and some studies even reported little or no value in the multiple correlation technique if the group being studied

had a restricted range on the intellectual factor being measured. Even the best prediction equations were reporting multiple correlations that were disappointingly small. The shortcomings of this technique encouraged an interest in searching for other factors, referred to as non-intellectual factors, that might produce better predictions of academic success.

#### Non-intellectual factors

Fishman and Pasanella also noted in their review an increase in the number of studies that were being conducted to search out non-intellectual factors for the purpose of predicting academic success. The factors that received the most attention in the research reported were personality and interest. The instruments that appeared most commonly in the search for non-intellectual factors included the California Personality Inventory, the Rorschach, the Minnesota Multiphasic Personality Inventory, the Edwards Personal Preference Schedule, and the Strong Vocational Interest Blank. They reported very few studies that found success is using non-intellectual factors as predictors of academic success, either alone or when combined with the intellectual factors.

Similar conclusions were reached by Mayhew (1965) and Lavin (1965). They reported that personality measures and background characteristics sometimes increase the prediction of academic success when combined with the high school rank

and other academic aptitude measures, but any increase is very slight. They both have indicated that addition of such non-intellectual factors might actually decrease the prediction of academic success.

Studies of prediction at the college level have been mainly concerned with the prediction of academic success. However, academic success seems to be only part of the concern that students are expressing when they seek the help of the high school or college counselor. They not only want to know what they would be successful doing but they want to know what they would be interested in doing or receive satisfaction from doing.

#### Studies Related to the Present Study

Berdie (1944) indicated that effective counseling of college students involves the prediction of achievement and satisfaction. He concluded that tests of ability were the best predictors of academic achievement and proceeded to investigate a measure of satisfaction. The sample for this study was drawn from the student body of the engineering school at the University of Minnesota. Berdie obtained a measure of satisfaction with the curriculum by using an adapted form of Hoppock's Satisfaction Blank. The relationships between curriculum satisfaction, college grades and test scores were analyzed. The test scores were obtained from the placement tests used for all freshmen attending the University of Minnesota at that

time, which included the Strong Vocational Interest Blank. The results of the study indicated no single factor was highly related to a student's satisfaction with his curriculum. Satisfaction was found to be significantly related to academic achievement but the correlation was only .23. There were some indications that students who scored extremely high or low on the satisfaction scale could be differentiated on the basis of the engineering scale on the Strong Vocational Interest Blank. Berdie did however, conclude that:

"The results of this study do not demonstrate that interests will or will not predict curriculum satisfaction. They do suggest that this might be a profitable field of study and that a more complete measure of satisfaction, a more heterogeneous group of people, and a longer time interval might provide more conclusive results." (Berdie, 1944, p. 245)

Only one of the eight performance measures, high school rank, was significantly related to satisfaction with college curriculum. This study encouraged several other researchers to investigate college students and their environment.

Betz, Klingensmith and Menne (1970) reported the following concerning studies of student satisfaction:

"Studies of college and student characteristics have proliferated in recent years in an effort to measure and understand student attitudes and college adjustment. A number of well-developed instruments are available for the study of such variables as the college environment (Astin, 1963; Pace, 1963), student needs (Stern, 1963) and student-environment congruence (Pervin, 1967 a, b). In contrast, however, there has been a dearth of systematic research focusing on college student satisfaction. Relatively little progress has been made toward developing and evaluating measures of college student satisfaction, or toward understanding the nature of student satisfaction, the components, correlates,



causes, or effects of this ever-present campus variable." (Betz et al., 1970)

This report described the development of the College Student Satisfaction Questionnaire (CSSQ). The research on the development of this instrument was part of a project directed at an intensive study of student satisfaction. The whole project was based on the premise that the study of college student satisfaction could draw upon principles and methods that have resulted from years of research on employees in business and industry. The CSSQ was modeled after the Minnesota Satisfaction Questionnaire developed by Weiss, Dawis, England, and Lofquist (1967) used to measure job satisfaction in connection with the Theory of Work Adjustment. The CSSQ has since been used to collect data on students from other colleges and universities and to further define the generalizability on findings on college student satisfaction.

The CSSQ was also used in the Starr et al. study quoted in the introduction of this thesis. The Starr et al. (1972) study reported the feasibility of using the framework of the Theory of Work Adjustment for studying College students and their environment.

#### Summary of Literature Reviewed

The review of literature has shown various theories and their descriptions of vocational choice. It has been noted that all of these theories offer the counselor background

knowledge to better understand his counselees and the problems they face in making decisions concerning career choice. Few of the theories, however, offer a framework for putting research findings to practical use by the counselor or counselee. The prediction studies, while numerous, have for the most part been concerned with only part of the problem that students face, prediction of academic success. A few projects have been directed at looking at achievement and satisfaction. It has also been noted that the Theory of Work Adjustment is a feasible framework for studying college students and their environment. These findings have all been factors in the design of the present study. The study was extended to include a measure of job satisfaction in an attempt to look at the long-range implications referred to as important considerations by the authors of the Theory of Work Adjustment.

## PROCEDURE

## The Sample

The graduates of the Engineering Cooperative Education Program at Iowa State University totalled 340 from the time of the first graduation in 1957 through the spring quarter graduation in 1971. This group of graduates was used as the sample for this study. A list of the names of the graduates was obtained from the College of Engineering and their addresses were furnished by the Iowa State University Alumni Office. All of the graduates on this list were contacted by mail and were given an opportunity to participate in this study. Of the 340 graduates contacted, 264 volunteered to act as subjects for this investigation. These 264 graduates represented 78% of the total group and was felt to be a representative sample of the total number of graduates of the Engineering Cooperative Education Program at Iowa State University. The sample consisted of 263 males and one female, however, test data were not available for the one female graduate so the sample size became 263. The age range of the subjects was from 22 to 43 years, with a mean of 28.08 years and a standard deviation of 4.25 years. The time since graduation ranged from 1 to 15 years with a mean of 5.57 years and a standard deviation of 4.21 years. Test data were obtained from the University records of the subjects and additional information was collected directly from the subjects by means of a questionnaire

that was mailed to them.

### Instrumentation

The data obtained from the University records consisted of the subject's High School Rank, the composite score on the American College Test, the score on the Otis Quick-Scoring Mental Ability Test, the score on the Minnesota Scholastic Aptitude Test and the Grade Point Average at the time of graduation.

The High School Rank (HSR) is computed by ranking the students in a given high school class starting with the highest ranking student as number 1. The rank for each student is divided by the number of students in the given class gives the student's HSR. Thus the low HSR's (e.g., from 1 to 10) indicate the students in the top ten percent of the high school class. Iowa State normally accepts only students within the top half of their high school class. These students, therefore, have a HSR in the range of 1 to 50.

The American College Test (ACT): This test consists of four subtests, English, social studies, natural science, and mathematics. The test was designed to measure the ability to perform the kinds of intellectual tasks typically performed by college students. Raw scores for each subtest are obtained by counting the number of correct responses. The raw scores for the four subtests are averaged and this average score becomes

the composite score for the test. Research at Iowa State University has indicated that the subtest scores are not helpful in predicting class grades or freshmen grade point average and therefore, only the composite score on the ACT is considered in the orientation testing program. For this reason, only the composite score on the ACT was used for this study.

The Otis Quick-Scoring (Gamma) Mental Ability Test (Otis):

The Otis Gamma test was designed to be used with high school and college students to measure mental ability. The test consists of 80 items in various formats: general information, vocabulary, analogies, arithmetic, number series, verbal and non-verbal reasoning. The score of this test is derived by counting the number of correct responses. Age norms are used to convert the raw score into an I.Q. score. This study made use of the raw scores on this and other tests to permit the proper statistical treatment of the data.

The Minnesota Scholastic Aptitude Test (MSAT): The 1957 edition of the MSAT by Wilbur L. Layton and Herbert Toops was also included in this study. This test consists of 78 items and is divided into three subtests, namely, reading comprehension, vocabulary and verbal analogies. Mathematics is not involved in this test. The purpose of the MSAT is to appraise what has been called scholastic aptitude or general intelligence with special reference to the requirements of most college curricula.

The Edwards Personal Preference Schedule (EPPS): This inventory was primarily designed as a instrument for research and counseling purposes. It provides a quick and convenient measure of relatively independent normal personality variables. The EPPS consists of 225 pairs of items dealing with likes and feelings. The person taking the test selects the item that best fits his likes or feelings. There is no time limit on this instrument and the scoring provides the subtest scores for the 15 personality variables being measured. The names of these variables are as follows: (for author's definitions see Appendix C)

1. Achievement (ach)
2. Deference (def)
3. Order (ord)
4. Exhibition (exh)
5. Autonomy (aut)
6. Affiliation (aff)
7. Intraception (int)
8. Succorance (suc)
9. Dominance (dom)
10. Abasement (aba)
11. Nurturance (nur)
12. Change (chg)
13. Endurance (end)
14. Heterosexuality (het)
15. Aggression (agg)

The questionnaire: A measure of satisfaction with college was needed so a questionnaire was constructed to obtain these data. The questionnaire provided an opportunity to collect other data including a measure of job satisfaction. After a review of several job satisfaction measures, including a review of such instruments by Crites (1966), a decision was made to use the Hoppock Job Satisfaction Blank Number 5. Permission was requested and received from Dr. Hoppock to include his job satisfaction blank as a part of the questionnaire. Hoppock's instrument provides an overall measure of job satisfaction and according to Crites it is one of the best measures of its kind that is available. The questionnaire was pre-tested and revised before it was distributed for the collection of data. The pre-test was conducted using 25 readers who were knowledgeable in the construction and use of questionnaires.

The item used on the questionnaire for measuring satisfaction with college was constructed using the same terminology used on the Hoppock instrument and was stated as follows:

Check one of the following statements which best shows how you liked your total college experience. (Include your Coop work experience periods.)

- I loved it. (7)
- I was enthusiastic about it. (6)
- I liked it. (5)
- I was indifferent about it. (4)
- I didn't like it. (3)
- I disliked it. (2)
- I hated it. (1)

The numbers in parentheses did not appear on the questionnaire, however they are included here to show the scores assigned to

each response. The range of scores ran from a low score of one to a high score of seven.

The Hoppock Job Satisfaction Blank was scored using the scoring formula designed for the instrument by Hoppock. A total score is obtained by adding the appropriate score for each item on the Blank. The range of scores for this measure run from 4 to 28.

#### Collection of the Data

The High School Rank, ACT, and MSAT scores were obtained from University records. The Otis and EPPS scores were obtained from reports made by the Student Counseling Service on students who were applying for admission to the Cooperative Education Program. The HSR was available on all of the students. The ACT and MSAT scores were not available on all of the subjects because some of them had entered the program before these tests became a part of the placement testing program. The test report from the Student Counseling Service was strongly recommended for applicants to the Cooperative Education Program but not required, so there were a number of subjects who had not taken the Otis or the EPPS. The data available were collected, coded, and key punched on data cards to permit the statistical treatments to be handled by the computer.



The additional data were collected by means of the constructed questionnaire. The questionnaires were mailed to all graduates of the Engineering Cooperative Education Program. The first mailing contained an addressed, stamped return envelop and a letter from the Dean of the College of Engineering (see Appendix B). The first mailing brought responses from 200 of the graduates by the end of the third week. A second mailing was made at the end of the third week. This mailing consisted of a letter from the investigator and another copy of the questionnaire. The second mailing produced an additional 45 returns. A third mailing was made at the end of the sixth week. This was the final mailing and it produced an additional 19 returns. The final mailing also contained a letter from the investigator and a copy of the questionnaire. Copies of the second and third letters can be seen in Appendix B. The total for the three mailings amounted to 264. The 264 respondents represented 78% of the total number of graduates of the Engineering Cooperative Education Program. The data collected on the questionnaire were coded and key punched on the data cards.

#### Statistical Treatment

The various statistical treatments used in this study were dictated by the objectives of the study. A computer program referred to as SCAN was used to obtain ranges,

frequency counts, means and standard deviations for all of the variables in order to describe the sample. Pearson Product-moment correlations were calculated and used to test the hypotheses. Scattergrams were generated to provide a look at the shape of the distributions for the variables under investigation. The multiple regression technique was used to obtain regression equations and multiple correlations to best describe the ability-requirements and need-reinforcers of the academic program being investigated.

## FINDINGS

The present investigation had six main objectives. The objectives were stated as follows:

1. To determine whether or not the measure of satisfactoriness (GPA) and the measure of satisfaction with college (scale on the questionnaire) are independent measures.
2. To determine whether or not the measures under investigation (High School Rank, American College Test, Otis, and Minnesota Scholastic Aptitude Test) can be used as measures of correspondence of satisfactoriness for graduates of the Engineering Cooperative Education Program at Iowa State University.
3. To determine whether or not the Edwards Personal Preference Schedule can be used as a measure of correspondence of satisfaction with college for graduates of the Engineering Cooperative Education Program at Iowa State University.
4. To describe the ability-requirements of the Engineering Cooperative Education Program at Iowa State University.
5. To describe the need-reinforcers of the Engineering Cooperative Education Program at Iowa State University.

6. To determine whether or not the measures under investigation are predictors of Job Satisfaction of graduates of the Engineering Cooperative Education Program as measured by Hoppock's Job Satisfaction Blank Number 5.

The findings will be presented in the same order as the stated objectives and the related hypotheses being tested.

#### Objective One

The first part of this investigation was concerned with the relationship between the measures of satisfactoriness and satisfaction. Since the theory requires that these two measures be independent measures, this was the first relationship to be tested. The hypothesis used to test this relationship was stated in the null form as follows:

Hypothesis 1: There is no significant relationship between measures of satisfactoriness (GPA) and satisfaction with college (scale on the questionnaire).

The test of this hypothesis made use of Pearson product-moment correlations. The computed correlation coefficient was used to test the null hypothesis that  $r = 0$ . The value for checking the significance of the correlation was obtained from a table developed by R. A. Fisher and included in a publication by Snedecor and Cochran (1967, p. 557). This table value was obtained by entering the table using the degrees of

freedom which in this test, and all other tests in this investigation that used correlations, was  $n - 2$ . The number of pairs used in computing this correlation was 256, which made the degrees of freedom 254. The table value for 254 degrees of freedom, at the .05 level of significance was  $r = .126$ . Since the computed value was  $r = .054$ , the null hypothesis was not rejected, which indicated that the measures of satisfactoriness and satisfaction were independent measures.

### Objective Two

The second part of this investigation was directed at the ability measures to determine whether or not they were measures of correspondence for satisfactoriness. The hypotheses that were tested in part two of this study included hypothesis two through hypothesis five. They were stated in the null form as follows:

Hypothesis 2: There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and High School Rank.

Hypothesis 3: There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and scores on the American College Test.

Hypothesis 4: There is no significant relationship between Final Grade Point Average of graduates of the

Engineering Cooperative Education Program and scores on the Otis Quick-Scoring Mental Ability Test.

Hypothesis 5: There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and scores on the Minnesota Scholastic Aptitude Test.

Pearson product-moment correlations were computed for the four variables mentioned in these hypotheses and the Final Grade Point Average of the graduates of the Engineering Cooperative Education Program. The correlations were then used to test the null hypothesis, that  $r = 0$  for all of the four hypotheses stated above. The values for checking the significance of the correlations for this, and all other parts of this investigation, were again obtained from the table developed by Fisher. The computed correlations for the first four variables are reported in Table 1.

The number of pairs used to test hypothesis two was 258, which made the degrees of freedom 256 for this test. The table value for 256 degrees of freedom at the .05 level of significance was  $r = .121$ . Since the computed value was  $r = -.214$ , the null hypothesis number two was rejected.

The test of the null hypothesis number three included 195 pairs of observations. The table value for 193 degrees of freedom was  $r = .141$  and since the computed value of  $r$  was  $.270$ , the null hypothesis number three was rejected.

Table 1. Pearson product-moment correlations between Final Grade Point Average and various test scores for graduates of the Engineering Cooperative Education Program at Iowa State University

Name of test	Number of pairs	Degrees of freedom	Correlation
High School Rank	258	256	-.214**
American College Test	195	193	.270**
Otis Mental Ability Test	263	262	.278**
Minnesota Scholastic Aptitude Test	238	236	.299**

\*\* Significant at the .01 level.

Hypothesis number four had 263 observations and the degrees of freedom for the test of significance became 261. The table value for 261 degrees of freedom was  $r = .123$ , the computed value was  $r = .278$  and therefore the null hypothesis number four was rejected.

There were 238 observations included in the test of hypothesis number five. The table value for 236 degrees of freedom was  $r = .129$ . The computed value was  $r = .299$  and therefore the null hypothesis number five was rejected. The correlations were highly significant at the .01 level for all four variables.

## Objective Three

The third part of this investigation dealt with the measures of correspondence for satisfaction. Only one hypothesis was tested in this part of the study and it was stated in the null form as follows:

Hypothesis 6: There is no significant relationship between satisfaction with college for graduates of the Engineering Cooperative Education Program and needs as measured by the Edwards Personal Preference Schedule.

Pearson product-moment correlations were computed using the stated satisfaction with college scores obtained on the questionnaire and the fifteen need scales measured by the Edwards Personal Preference Schedule. The test of the null hypothesis,  $r = 0$ , was conducted in the same manner as the tests used in part one of this study. The computed correlations for all need scales on the Edwards and satisfaction with college are reported in Table 2 in order to show all of the relationships that exist for the sample used in this study.

The number of pairs of observations was 129 for all of the Edwards and satisfaction with college scales. The table value for 127 degrees of freedom at the .05 level of significance was  $r = .173$ , since four of the scales (Deference, Autonomy, Change, Aggression) had computed correlations higher than this table value, the null hypothesis number six was rejected. This finding indicates that these need scales on the Edwards



Table 2. Pearson product-moment correlations for satisfaction with college scores and scores on the need scales on the Edwards Personal Preference Schedule for graduates of the Engineering Cooperative Education Program at Iowa State University

Edwards scale name	Number of pairs	Degrees of freedom	Correlation
Achievement	129	127	.081
Deference	129	127	.202*
Order	129	127	.060
Exhibition	129	127	-.108
Autonomy	129	127	-.218*
Affiliation	129	127	.157
Intracception	129	127	-.022
Succorance	129	127	-.140
Dominance	129	127	.134
Abasement	129	127	.020
Nurturance	129	127	.123
Change	129	127	-.222*
Endurance	129	127	.112
Heterosexuality	129	127	-.007
Aggression	129	127	-.176*

\* Significant at the .05 level.

do tend to describe the successful students in the Engineering Cooperative Education Program.

#### Objective Four

The fourth part of this investigation was concerned with the description of the ability-requirements for the Engineering Cooperative Education Program at Iowa State University. One method of describing the ability-requirements made use of the range, mean and standard deviations of the ability measures tested and found to be measures of correspondence for satisfactoriness. These statistics are reported in Table 3 to show the characteristic patterns of abilities of the graduates of the Engineering Cooperative Education Program at Iowa State University. The statistics provide a source of information for prospective students to use in comparing themselves to individuals who have been successful in the program.

Another method of describing the ability-requirements made use of multiple regression equations. The multiple regression technique was used to find the best combination of predictors of satisfactoriness. The regression equations, the multiple R's and multiple R squares are reported in Table 4.

The regression equations, multiple correlations and  $R^2$  reported in Table 4 show the relationship that exists and the amount of variance that can be accounted for when using the various combinations of predictor variables. Since even the

Table 3. Ability-requirements for the Engineering Cooperative Education Program at Iowa State University as described by the measures of correspondence of satisfactoriness

Measure	Range of raw scores	N	Mean	Standard deviation
HSR <sup>a</sup>	1 to 45	254	11.37	9.00
ACT	20 to 31	195	27.71	2.31
Otis	49 to 79	264	69.30	5.68
MSAT	24 to 74	238	57.51	10.17

<sup>a</sup>HSR was available for 335 of the subjects. Using N = 335, the range was 1 to 45, the mean was 11.90 and the standard deviation was 9.35. A t test indicated no significant difference in the means and therefore the sample is representative of the total group of graduates.

Table 4. Regression equations, multiple R's and multiple R squares using the best predictors of Final Grade Point Average for the Engineering Cooperative Education Program at Iowa State University

Regression equation	N	R	R <sup>2</sup>
$\hat{y} = 2.28 + .0113 \text{ (MSAT)}$	238	.299	.0894
$\hat{y} = 2.58 - .0092 \text{ (HSR)} + .0078 \text{ (MSAT)}$	235	.368	.1355
$\hat{y} = 2.46 - .0115 \text{ (HSR)} - .0244 \text{ (ACT)}$ $+ .0106 \text{ (Otis)} + .0092 \text{ (MSAT)}$	181	.391	.1527

best combination of these predictors accounts for very little of the variance, the regression equations are of no practical

value. That is, they should not be used to predict a grade point average for an individual student.

### Objective Five

The fifth part of the investigation was concerned with the description of the need-reinforcers of the Engineering Cooperative Education Program at Iowa State University. The need-reinforcers were identified using the Edwards Personal Preference Schedule. The same techniques have been used in reporting these findings, as those used to describe the ability-requirements reported in part three of this chapter. The range, means and standard deviations of the significant need scales are reported in Table 5. These statistics show the characteristic pattern of needs that appear to be fulfilled by the Engineering Cooperative Education Program at Iowa State University. Prospective students could compare their scores on these scales, with the scores as reported, to anticipate whether or not they would be satisfied with the program.

A regression equation was constructed using the best single predictor, which was found to be the Change scale. Combinations of the change scale and the other scales were investigated using the multiple regression technique. The best regression equations for predicting satisfaction with college are reported in Table 6. The multiple R's and multiple R squares are also included in Table 6.

Table 5. Need-reinforcers for the Engineering Cooperative Education Program at Iowa State University as described by the measures of correspondence of satisfaction with college

Edwards need scale	Range (Raw scores)	N	Mean	Standard deviation
Deference	2 to 21	172	12.15	3.36
Autonomy	1 to 22	172	12.81	4.08
Change	5 to 27	172	15.71	4.25
Aggression	3 to 23	172	11.92	4.11

Table 6. Regression equations, multiple R's and multiple R squares using the best predictors of satisfaction with college for the Engineering Cooperative Education Programs at Iowa State University

Regression equations	N	R	R <sup>2</sup>
$\hat{y} = 6.24 - .0448$ (Change)	172	-.222	.0493
$\hat{y} = 6.93 - .0472$ (Auto) - .0441 (Chg)	128	.301	.0906
$\hat{y} = 6.33 + .0412$ (Def) - .0409 (Auto) - .04317 (Chg)	128	.342	.1169
$\hat{y} = 6.51 + .0365$ (Def) - .0363 (Auto) - .0428 (Chg) - .0156 (Agg)	128	.349	.1220

Table 6 presents the regression equations, multiple correlations and the R<sup>2</sup> values to show the relationship that exists and the amount of variance that can be accounted for by these predictors. Since they account for very little of the variance,

ship that exists and the amount of variance that can be accounted for when using the various combinations of predictors.

#### Objective Six

The fifth part of this investigation was concerned with testing the measures of correspondence of satisfactoriness and satisfaction, for the Engineering Cooperative Education Program, to determine whether or not they are significantly related to eventual job satisfaction. The job satisfaction score was obtained by using the Hoppock Job Satisfaction Blank Number 5. Pearson product-moment correlations were computed for the various ability and need measures and the total score on the Hoppock instrument. These correlation coefficients are reported in Table 7 in order to show the lack of relationship that exists between all measures used in this study and job satisfaction for individuals in the sample. This finding indicates that job satisfaction can not be predicted from the scores on the ability or need measures investigated in this study.

The hypotheses that were tested in this part of the investigation were stated in the null form as follows:

Hypothesis 7: There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and High School Rank.

Table 7. Pearson product-moment correlations for Job Satisfaction scores and scores on the ability and need measures for the graduates of the Engineering Cooperative Education Program at Iowa State University

Ability or need measure	Number of pairs	Degrees of freedom	Correlation
HSR	245	243	.001
ACT	133	131	-.085
Otis	194	192	.072
MSAT	170	168	-.047
Achievement	126	124	.108
Deference	126	124	-.095
Order	126	124	-.026
Exhibition	126	124	.017
Autonomy	126	124	-.180*
Affiliation	126	124	-.010
Intracception	126	124	.049
Succorance	126	124	.158
Dominance	126	124	-.035
Abasement	126	124	-.056
Nurturance	126	124	.043
Change	126	124	-.053
Endurance	126	124	.073
Heterosexuality	126	124	-.034
Aggression	126	124	-.017

\* Significant at the .05 level.

Hypothesis 8: There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and scores on the American College Test.

Hypothesis 9: There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and scores on the Otis Quick-Scoring Mental Ability Test.

Hypothesis 10: There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and scores on the Minnesota Scholastic Aptitude Test.

Hypothesis 11: There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, and Needs as measured by the Edwards Personal Preference Schedule.

The correlation coefficients were used to test these null hypotheses. The table value for 243 degrees of freedom was  $r = .129$  and the computed correlation using high school rank and job satisfaction was  $r = .001$ , therefore hypothesis was not rejected.

The table value for 131 degrees of freedom was  $r = .171$ , since the computed correlation using American College Test



scores and job satisfaction was  $r = -.085$  hypothesis 8 was not rejected.

The table value for 192 degrees of freedom was  $r = .141$ , since the computed correlation for the Otis scores and job satisfaction was  $r = .072$ , hypothesis 9 was not rejected.

The table value for 168 degrees of freedom was  $r = .148$ , since the computed correlation for the Minnesota Scholastic Aptitude Test scores and job satisfaction was  $r = -.047$ , hypothesis 10 was not rejected.

The table value for 124 degrees of freedom was  $r = .174$ , since the computed correlation for the Autonomy scale on the Edwards Personal Preference Schedule and job satisfaction was  $r = -.180$ , hypothesis 11 was rejected.

#### Other Findings of Interest

The questionnaire used in this investigation provided additional data not required for testing the hypothesis generated by the six objectives. All of the data were included in the analysis that produced the correlations for testing the various hypothesis. The relationships of the variables presented in Table 8 tend to confirm commonly accepted factors of job satisfaction. Satisfaction with college indicates a tendency to be satisfied on the job.

Table 8. Additional variables that correlate significantly with job satisfaction of graduates of the Engineering Cooperative Education Program at Iowa State University

Variable	Number of pairs	Degrees of freedom	Correlation
Salary	232	230	.199**
Cooperative work experience was of benefit on first job.	248	246	.231**
Number of dependents	206	204	.147*
Satisfaction with College	247	245	.151*

\* Significant at the .05 level.

\*\* Significant at the .01 level.

A complete correlation matrix is included in Appendix D.

## DISCUSSION

It is a basic assumption of the Theory of Work Adjustment, and the adaptation of the theory, that each individual seeks to achieve and maintain correspondence with his environment. All of the individuals in the sample of this study were graduates of the Engineering Cooperative Education Program so it can be assumed that all of them had achieved and maintained some degree of correspondence with their academic environment. This assumption, plus the fact that the other necessary data for testing the three propositions in question were also available, indicated that it was an appropriate sample for this investigation.

The basic requirement for either the Theory of Work Adjustment, or the adaptation of the theory, is that measures of satisfactoriness and satisfaction must be independent measures. Therefore, the first hypothesis was stated in order to test this relationship and it was stated in the null form as follows:

Hypothesis 1: There is no significant relationship between measures of satisfactoriness (GPA) and satisfaction with college (scale on the questionnaire).

This null hypothesis was not rejected which indicated that the measures of satisfactoriness and satisfaction used in this study were independent measures. This finding supports the requirement applied in Proposition I that satisfactoriness

and satisfaction are independent indicators of adjustment to college. Proposition I as stated in the adaptation of the theory appears to be a valid one. This finding also indicates that Final Grade Point Average can be used as a measure of satisfactoriness and the scale on the questionnaire can be used as a measure of satisfaction with college. Proposition I in the adaptation of the theory was stated as follows:

Proposition I: A college student's academic adjustment at any point in time is indicated by his concurrent levels of satisfactoriness and satisfaction.

When satisfactoriness can be predicted from ability test scores, as in the typical selection process, the closeness of the predicted satisfactoriness to the observed satisfactoriness is a measure of correspondence between the individual's abilities and the ability requirements of the academic program. The relationship of closeness was expressed by correlation coefficients in this study. Four hypotheses were stated in the null form in order to test the relationship between the ability tests and satisfactoriness (GPA). The hypotheses were stated as follows:

Hypothesis 2: There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and High School Rank.

Hypothesis 3: There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and scores on the American

College Test.

Hypothesis 4: There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and scores on the Otis Quick-Scoring Mental Ability Test.

Hypothesis 5: There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and scores on the Minnesota Scholastic Aptitude Test.

All four of these hypotheses were rejected which indicated that all four ability measures can be used as measures of correspondence of satisfactoriness. These findings lend support to Proposition II which states in part that Satisfactoriness is a function of the correspondence between a student's abilities and the ability requirements of the academic program. Therefore, Proposition II as stated in the adaptation of the theory appears to be valid.

Since Proposition II appears to be valid and it has been shown that satisfactoriness can be predicted from the ability tests, it follows that Corollary IIa of the adaptation of the theory is also valid. Corollary IIa was stated as follows:

Corollary IIa: Knowledge of a student's abilities and his satisfactoriness permits the determination of the effective ability requirements of the academic program.

The findings indicated that final grade point average could be used as a measure of satisfactoriness and that the four ability measures could be used to predict satisfactoriness. Therefore, applying Corollary IIa, using these measures, it was possible to determine what the effective ability requirements are for the Engineering Cooperative Education Program at Iowa State University. The effective ability requirements were reported in terms of the range or raw scores, means and standard deviations for each of the four ability measures. The data for the ability measures had been obtained on the individuals in the sample when they were entering Iowa State University as freshmen. Therefore, they provide reasonably accurate information for prospective students who are considering entering the program.

Three regression equations for predicting satisfactoriness were reported to illustrate another method of describing ability requirements. The best predictor of satisfactoriness was the Minnesota Scholastic Aptitude Test. The resulting  $R^2$  indicated that this ability measure accounts for nine per cent of the variance. The addition of the High School Rank to the prediction equation increased the  $R^2$  value by .05. When all of the ability measures were used in the prediction equation the resulting  $R^2$  value was only increased by an additional .02. The increases in the  $R^2$  values were statistically significant, however the practicality of using the multiple equations might

be questionable. If the counselor does make use of the prediction equation in the counseling interview, he must be aware of the limitations of their usefulness. The use of the regression equation in counseling was expressed by Zytowski (1970) as follows:

"By means of the regression equation, the counselor could (few do) compute the most expected score on the criterion from the client's score on the predictor. For instance, he could say to a client, "You are most likely to get a grade point average of 2.47 at the college you are considering." What he must also say, because his prediction is predicted on group experience and the correlation he is using is apt to be less than perfect, is "that 2 out of 3 persons who score as you did on the Academic Classification Test score between 2.03 and 2.89. As the correlation gets lower, the band of expectation gets wider, until when the correlation is zero, or close to it, the counselor must say, "I cannot predict how you will do in college, based on this, say, Modern Language Aptitude Test score" (Zytowski, 1970, p. 8).

Since the sample for this study included only graduates, the range was restricted and all of the resulting correlation coefficients were rather low. If the sample had included all individuals who entered the program the correlations would have been larger. The number of students who entered the program but did not finish was rather small. Test data were available for only five of these individuals who did not complete the program and therefore it did not seem feasible to include them in the investigation.

When satisfaction can be predicted from need scores, the closeness of the predicted satisfaction to the measured satisfaction with college is a measure of the correspondence

between the individual's needs and the reinforcer system of the academic environment. Again the relationship of closeness was expressed by correlation coefficients. One null hypothesis was stated in order to test the relationship between the need scales on the Edwards Personal Preference Schedule and satisfaction with college. The null hypothesis was stated as follows:

Hypothesis 6: There is no significant relationship between stated satisfaction with college for graduates of the Engineering Cooperative Education Program and needs as measured by the Edwards Personal Preference Schedule.

This null hypothesis was rejected since four of the scales on the Edwards Personal Preference Schedule correlated significantly with the measure of satisfaction with college. These findings lend support to Proposition III of the adaptation of the theory, which states that satisfaction with college is a function of the correspondence between the reinforcer system of the academic program and the student's needs. Therefore, Proposition III as stated in the adaptation of the theory appears to be valid.

Since Proposition III appears to be valid and therefore satisfaction with college can be predicted from the need scales on the Edwards Personal Preference Schedule, it follows that Corollary IIIa of the adaptation of the theory is also valid. Corollary IIIa was stated as follows:



Corollary IIIa: Knowledge of a student's needs and his satisfaction permits the determination of the effective reinforcer system of the academic program.

The findings indicated that the scale on the questionnaire could be used as a measure of satisfaction and that the Edwards Personal Preference Schedule could be used to predict satisfaction with college. Therefore, applying Corollary IIIa, using the Edwards Personal Preference Schedule, it was possible to describe the need reinforcer system for the Engineering Cooperative Education Program at Iowa State University. The need-reinforcers were reported in terms of the range of raw scores, means and standard deviations. Regression equations were also computed to illustrate another method of expressing the need-reinforcer system. If these regression equations are used, the counselor must again be aware of their limitations as mentioned in connection with the prediction equations for satisfactoriness.

A third method of expressing the need-reinforcers, which is probably the most informative method, is a verbal description of the needs as defined by the scales on the Edwards Personal Preference Schedule.

The correlation coefficient reported for the relationship between satisfaction with college and the deference scale was  $r = .202$ . The correlation was both significant and positive, which indicated that graduates of the Engineering Cooperative Education Program tended to score rather high on the deference

scale. A high score on this scale indicates that these individuals could be described as having a manifest need to follow instructions and do what is expected of them.

The correlation coefficient reported for the relationship between satisfaction with college and the autonomy scale was  $r = -.218$ . The correlation was significant and negative, which indicated that graduates of the Engineering Cooperative Education Program tended to score low on the autonomy scale. A low score on the autonomy scale indicates that the graduates do not describe themselves as having this need. The low score could be interpreted as meaning these individuals do not feel the need to be independent or to avoid responsibilities and obligations.

The correlation coefficient reported for the relationship between satisfaction with college and the change scale was  $r = -.222$ . The correlation was significant and negative which indicated that graduates of the Engineering Cooperative Program tended to score low on the change scale. The low score on the change scale could be interpreted as meaning these individuals do not feel the need to experience a great deal of change in their daily routine.

The correlation coefficient reported for the relationship between satisfaction with college and the aggression scale was  $r = -.176$ . The correlation was significant and negative which indicated that graduates of the Engineering Cooperative

Education Program tended to score low on the aggression scale. The low score on the aggression scale could be interpreted as meaning these individuals do not feel the need to become angry or to blame others when things go wrong.

To summarize, individuals who successfully complete the Engineering Cooperative Education Program seem to like to follow instructions, do what is expected of them, accept responsibility and demand little change in their daily routine. These needs seem to be reinforced by the program. Prospective students can compare their needs to these in order to have some idea as to whether or not they would be satisfied with the program.

When the relationships between job satisfaction and ability measures were tested, the correlations were found to be non-significant. The null hypotheses used for testing these relationships were therefore not rejected.

When the relationship between job satisfaction and the scales on the Edwards Personal Preference Schedule were tested, the correlation coefficient for the autonomy scale was found to be significant. The null hypothesis number eleven was therefore rejected. The rejection of this null hypothesis indicated that a relationship does exist between job satisfaction and the autonomy scale on the Edwards Personal Preference Schedule. Research reports have indicated that job satisfaction is much too complex to describe or predict using just one variable. Therefore, even though a slight relationship seems

to exist between the job satisfaction of individuals in this sample and the autonomy scale on the Edwards Personal Preference Schedule, it would appear unwise to attempt to describe the need-reinforcers for the entire work environment using only one score on one test.

For all practical purposes no significant relationships were found between job satisfaction and the scores on the tests investigated in this study. This finding provides a rather important implication for counselors who make use of these tests. Since no significant relationship exists between the test scores and job satisfaction they should not be used to try to predict or imply eventual job satisfaction in the field of engineering. The tests do tend to describe the academic environment and should be limited to that purpose if they are used in the counseling process.

The other significant findings reported in this study concerning salary, Coop work experience, number of dependents and satisfaction with college seem to fit commonly accepted patterns and similar results have been reported in other studies. Robinson, Connors and Whitacre (1966) reviewed the job satisfaction research conducted during 1964-65 and many studies have been included in this review that report similar relationships to those found in this investigation.

The correlation between salary and job satisfaction for the sample used in this study was both significant and positive.

This relationship indicates that the higher the salary the more satisfied an individual seems to be with his job. Since the correlation is not a high correlation, it might indicate that there is a point where the amount of salary is no longer the important factor in determining job satisfaction. Perhaps this point is reached for some individuals when they can buy what they need and what they want.

Satisfaction with college and the feeling that the Engineering Cooperative work experience was of benefit on the first job both correlated significantly and positively with job satisfaction. This finding may indicate that people who tend to be satisfied in one environment will also be satisfied in other environments that are somewhat related. Perhaps there are personality types that are inclined to be satisfied and other types that are inclined to be dissatisfied regardless of the environment in which they are working.

The relationship between the number of dependents and job satisfaction also proved to be significant and positive. The reasons for this relationship are not easily defined. They could be as simple as merely having a job in order to provide the basic needs for the dependents.

This study has shown that the necessary relationships do exist to permit the use of the first three propositions and corollaries in the adaptation of the Theory of Work Adjustment for the investigation of college students and their academic

environment in a given curriculum.

The following, although not tested in this investigation should also be noted. According to the academic advisors, students may leave the program before graduation for one or two reasons. One reason is because of a low grade point average. Students who leave for this reason may have realized they were not too successful and therefore transferred out of the program, while others may have been dropped by the scholarship standards committee. Another reason for leaving the program was the lack of interest or satisfaction, these students probably were doing satisfactory work but transferred to other academic programs. These reasons for leaving the program appear to lend support to Proposition VI and VII as stated in the adaptation of the theory. Therefore Proposition VIII must also be valid as stated. Given Proposition II, III and VIII, we have Corollary VIIIa which states that, graduation is a function of ability requirements and need-reinforcer correspondence.

The findings of this study indicated that the ability measures and the Edwards could be used as measures of correspondence of satisfactoriness and satisfaction which gave support to the use of the theory and its framework for future investigations dealing with college students and their environment. These measures were found to correlate significantly with satisfactoriness and satisfaction and therefore were used to describe the ability requirements and the need-reinforcer

systems of the Engineering Cooperative Education Program at Iowa State University. Regression equations were constructed using the best combinations of these factors and were presented as one other method of describing the environment, however they are of no practical value and should not be used to predict either satisfactoriness or satisfaction for individual students.

While the findings of this study support the use of the theory and its framework for future investigations dealing with college students and their environment, it should be noted that the measures used in this study are poor predictors of satisfactoriness and satisfaction for this program and other measures should be sought for this purpose. Thus, the results of the study are interpreted as giving support to the theory, even though the measures used must be improved before the theory can be employed in the guidance of individuals.

Future studies that apply the adaptation of the theory could prove to be worthwhile in the study of college students and their environments. A few suggestions are as follows:

1. A longitudinal study should be planned to test all of the Propositions of the adaptation of the Theory of Work Adjustment. This study should begin with a freshman class in a given curriculum and follow the entire group to a point in time when the majority of them have graduated. This would permit the collection of the proper data at the appropriate time.

2. Other tests and measures should be tested to determine whether or not they could be used to measure correspondence as defined in the theory.

3. If a particularly good set of measures are found for measuring correspondence, a series of studies could be conducted to provide accurate descriptions of ability requirements and need-reinforcers for various academic programs.

4. The College Student Satisfaction Questionnaire appears to measure satisfaction with college in useful terms and should be considered as a measure of satisfaction in future studies.



## SUMMARY

The purpose of the study was to test the first three propositions of the adaptation of the Theory of Work Adjustment to determine whether or not they provide a valid framework for the investigation of homogeneous groups of college students and their environment. The study was extended to include a measure of job satisfaction for graduates of an academic program to determine if job satisfaction could be predicted from test scores obtained when these individuals were freshmen in college.

The objectives were stated as follows:

## Objectives of the Study

1. To determine whether or not the measures of satisfactoriness (GPA) and the measure of satisfaction with college (scale on the questionnaire) are independent measures.
2. To determine whether or not the measures under investigation (High School Rank, American College Test, Otis, Minnesota Scholastic Aptitude Test) can be used as measures of correspondence of satisfactoriness for graduates of the Engineering Cooperative Education Program at Iowa State University.
3. To determine whether or not the Edwards Personal Preference Schedule can be used as a measure of correspondence of satisfaction with college for graduates of the Engineering

Cooperative Education Program at Iowa State University.

4. To describe the ability requirements of the Engineering Cooperative Education Program at Iowa State University.

5. To describe the need-reinforcers of the Engineering Cooperative Education Program at Iowa State University.

6. To determine whether or not the measures under investigation are predictors of job satisfaction of graduates of the Engineering Cooperative Education Program as measured by Hoppock's Job Satisfaction Blank Number 5.

The sample used in the present study was made up of graduates of the Engineering Cooperative Education Program at Iowa State University. This sample was selected because the data, necessary for testing the propositions in question, were available for a large number of these graduates. Graduates were used in this study because they had already successfully completed the program and had achieved and maintained some degree of correspondence with their academic environment.

Eleven hypotheses were generated in order to test the relationships that were being investigated. These hypotheses were stated in the null form as follows:

H<sub>0</sub>1 : There is no significant relationship between measures of satisfactoriness (GPA) and satisfaction with college (scale on the questionnaire). Failed to reject.

H<sub>0</sub>2 : There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and High School Rank. Rejected.

- H<sub>0</sub>3 : There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and scores on the American College Test. Rejected.
- H<sub>0</sub>4 : There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and scores on the Otis Quick-Scoring Mental Ability Test. Rejected.
- H<sub>0</sub>5 : There is no significant relationship between Final Grade Point Average of graduates of the Engineering Cooperative Education Program and scores on the Minnesota Scholastic Aptitude Test. Rejected.
- H<sub>0</sub>6 : There is no significant relationship between Stated Satisfaction with College for graduates of the Engineering Cooperative Education Program and Needs as measured by the Edwards Personal Preference Schedule. Rejected.
- H<sub>0</sub>7 : There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and High School Rank. Failed to reject.
- H<sub>0</sub>8 : There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and scores on the American College Test. Failed to reject.
- H<sub>0</sub>9 : There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and scores on the Otis Quick-Scoring Mental Ability Test. Failed to reject.
- H<sub>0</sub>10 : There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and scores on the Minnesota Scholastic Aptitude Test. Failed to reject.

H<sub>0</sub>11 : There is no significant relationship between Job Satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5, for graduates of the Engineering Cooperative Education Program and Needs as measured by the Edwards Personal Preference Schedule. Rejected.

A questionnaire was designed and pre-tested for collecting a measure of satisfaction with college and job satisfaction. This questionnaire was mailed to all 340 graduates of the program. Two follow-up letters were mailed to those not responding by the end of the second and fourth week after the first mailing. Completed questionnaires were received from 264 of the graduates, which represented 78% of the total number of graduates of this program at Iowa State University.

The data were coded and placed on data cards for statistical analysis on the computer. Frequency counts, means and standard deviations were obtained for descriptive purposes. Pearson product-moment correlation coefficients were computed for the purposes of testing the stated hypotheses. Multiple regression techniques were used to compute regression equations and to determine the best combination of predictor variables.

The findings of this study indicated that the first three propositions as stated in the adaptation of the Theory of Work Adjustment were valid. It was also shown that the ability measures could be used as measures of correspondence of satisfactoriness and that the Edwards Personal Preference Schedule could be used as a measure of correspondence of satisfaction with college. Various methods were reported to

describe the ability requirements and need reinforcers of the Engineering Cooperative Education Program at Iowa State University. The findings also pointed out the limitations of the tests and that no real relationship exists between the tests under investigation and job satisfaction, as measured by the Hoppock Job Satisfaction Blank Number 5.

The findings of the present study indicate that the adaptation of the Theory of Work Adjustment does offer a valid framework for the study of college students and their academic environment. However, the measures used to test the adaptation of the theory, while significant, accounted for very little of the variance when used for prediction purposes.

The results of the study are interpreted as giving support to the theory, even though the measures used must be improved before the theory can be employed in the guidance of individuals.

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I especially wish to express my gratitude to my wife, Margaret; my daughter, Becky and my son, Michael for their patience, understanding, cooperation and enthusiastic support during the past three years.

APPENDIX A: QUESTIONNAIRE

Name \_\_\_\_\_ Age \_\_\_\_\_ Sex \_\_\_\_\_  
 Last First 74 M.I.

Address \_\_\_\_\_  
 Street City State Zip Code

<u>Marital Status</u>	<u>Number of Dependents</u>	<u>Military Service</u>
Single	Spouse	ROTC What service? _____
Married	Children	Drafted What service? _____
Divorced	Parents	Enlisted What service? _____
Separated	Others	Discharge Date _____
Widow/er		

Were you married when you attended ISU?  No  Yes. If yes, how many children? \_\_\_\_\_

When at ISU, I lived in:  
 Dorm  
 Fraternity  
 Off-campus in Ames  
 Commuted from \_\_\_\_\_  
 Lived at home \_\_\_\_\_  
 Married student housing

Reasons for selecting the Coop Program:  
 (Check all that apply to you.)  
 For financial help with college expenses.  
 To determine if interests were in engineering.  
 Work experience that would lead to a better job.  
 For a more meaningful educational experience.  
 Other \_\_\_\_\_

Check one of the following statements which best shows how you liked your total college experience. (Include your Coop work experience periods)

- I loved it.
- I was enthusiastic about it.
- I liked it.
- I was indifferent about it.
- I didn't like it.
- I disliked it.
- I hated it.

Are you in graduate school?  Yes  No  
 If yes, are you attending because of the poor job market?  Yes  No

WORK EXPERIENCE

Job Title	Length of time employed	Monthly Salary	Name of Company	Why did you leave? (Promotion, etc.)
Present job or most recent	_____ Years Months	\$ _____		
What do you do?				
Previous job	_____ Years Months	\$ _____		
What did you do?				
Previous job	_____ Years Months	\$ _____		
What did you do?				

If you need more room use the back of this sheet.

How much benefit do you feel your Coop work experience was to you in your first job after graduation?

A great deal.     Some.     Very little.     Almost none.     None.

*Answers to the following questions should reflect your feelings concerning your present job. If you consider your present job to be temporary, please indicate your feelings as they relate to your last permanent (or major) engineering job.*

JOB SATISFACTION BLANK NO. 5 by Robert Hoppock

Choose the ONE of the following statements which best tells how well you like your job. Place a check mark (✓) in front of that statement:

1.  I hate it.
2.  I dislike it.
3.  I don't like it.
4.  I am indifferent to it.
5.  I like it.
6.  I am enthusiastic about it.
7.  I love it.

Check one of the following to show HOW MUCH OF THE TIME you feel satisfied with your job:

8.  All of the time.
9.  Most of the time.
10.  A good deal of the time.
11.  About half of the time.
12.  Occasionally.
13.  Seldom.
14.  Never.

Check the ONE of the following which best tells how you feel about changing your job:

15.  I would quit this job at once if I could get anything else to do.
16.  I would take almost any other job in which I could earn as much as I am earning now.
17.  I would like to change both my job and my occupation.
18.  I would like to exchange my present job for another job in the same line of work.
19.  I am not eager to change my job, but I would do so if I could get a better job.
20.  I cannot think of any jobs for which I would exchange mine.
21.  I would not exchange my job for any other.

Check one of the following to show how you think you compare with other people:

22.  No one likes his job better than I like mine.
23.  I like my job much better than most people like theirs.
24.  I like my job better than most people like theirs.
25.  I like my job about as well as most people like theirs.
26.  I dislike my job more than most people dislike theirs.
27.  I dislike my job much more than most people dislike theirs.
28.  No one dislikes his job more than I dislike mine.

Do you feel the Coop experience was a useful experience for you?  Yes  No  
 Would you recommend the Coop Program to our present students?  Yes  No

PLEASE RETURN IN THE ENCLOSED ENVELOPE.

APPENDIX B: LETTERS

Iowa State University *of Science and Technology*



Ames, Iowa 50010

Office of the Dean  
College of Engineering  
104 Marston Hall  
Telephone: 515-294-5933

February 1, 1972

Dear Co-op Graduate:

In order to learn how we can best serve and advise students who are considering the Cooperative Education Program, we are conducting a survey of our graduates. We thought you might be willing to take the time to complete the enclosed questionnaire. We feel that the students in the College of Engineering can benefit greatly from your experience.

Mr. Charles W. Jones of the Student Counseling Service is conducting this study as a part of his graduate program, and he assures us that all replies will be kept in complete confidence. No names will appear in the compilation or any report of the results of this study. We are sending this questionnaire to all of the graduates of the Iowa State University Cooperative Education Program. A large number of replies will make the study more meaningful so we hope you will take the time to complete and return the questionnaire.

I would like to take this opportunity to thank you for your cooperation in this matter.

Sincerely,

D. R. Boylan, Dean

DRB/clb

## FROM THE DESK OF

*Charles W. Jones*



*Dear Co-op Graduate,*

*Two weeks ago, I mailed a questionnaire to all Co-op grads.*

*Response has been most gratifying*

*and I am pleased that so many have found time in their busy schedules to complete and return the questionnaire. However, I find no record of your questionnaire being returned. Perhaps yours did not reach you. I am therefore enclosing another questionnaire in this mailing so that you will have the opportunity of having your responses included in the study. If you have already returned your completed questionnaire, please disregard this request.*

## FROM THE DESK OF

*Charles W. Jones*

3-24-72

Dear Co-op Grad,

*Nearly 80% of our graduates have taken the time to complete and return the questionnaire concerning their co-op experiences.*

*My records show that you are one of the 20% not represented in this study.*

*In case you have misplaced your questionnaire, I am sending along another copy so you can express your feelings and have them represented in the results of this study.*

*Thank you.*

*Chuck Jones*





APPENDIX C: EDWARDS DEFINITIONS OF NEEDS

1. ach Achievement: To do one's best, to be successful, to accomplish tasks requiring skill and effort, to be a recognized authority, to accomplish something of great significance, to do a difficult job well, to solve difficult problems and puzzles, to be able to do things better than others, to write a great novel or play.
2. def Deference: To get suggestions from others, to find out what others think, to follow instructions and do what is expected, to praise others, to tell others that they have done a good job, to accept the leadership of others, to read about great men, to conform to custom and avoid the unconventional, to let others make decisions.
3. ord Order: To have written work neat and organized, to make plans before starting on a difficult task, to have things organized, to keep things neat and orderly, to make advance plans when taking a trip, to organize details of work, to keep letters and files according to some system, to have meals organized and a definite time for eating, to have things arranged so that they run smoothly without change.
4. exh Exhibition: To say witty and clever things, to tell amusing jokes and stories, to talk about personal adventures and experiences, to have others notice and comment upon one's appearance, to say things just to see what effect it will have on others, to talk about personal achievements, to be the center of attention, to use words that others do not know the meaning of, to ask questions others cannot answer.
5. aut Autonomy: To be able to come and go as desired, to say what one thinks about things, to be independent of others in making decisions, to feel free to do what one wants, to do things that are unconventional, to avoid situations where one is expected to conform, to do things without regard to what other may think, to criticize those in position of authority, to avoid responsibilities and obligations.
6. aff Afflication: To be loyal to friends, to participate in friendly groups, to do things for friends, to form new friendships, to make as many friends as possible, to share things with friends, to do things with friends rather than alone, to form strong attachments, to write letters to friends.

7. int Intraception: To analyze one's motives and feelings, to observe others, to understand how others feel about problems to put one's self in another's place, to judge people by why they do things rather than by what they do, to analyze the behavior of others, to analyze the motives of others, to predict how others will act.
8. suc Succorance: To have others provide help when in trouble, to seek encouragement from others, to have others be kindly, to have others be sympathetic and understanding about personal problems, to receive a great deal of affection from others, to have others do favors cheerfully, to be helped by others when depressed, to have others feel sorry when one is sick, to have a fuss made over one when hurt.
9. dom Dominance: To argue for one's point of view, to be a leader in groups to which one belongs, to be regarded by others as a leader, to be elected or appointed chairman of committees, to make group decisions, to settle arguments and disputes between others, to persuade and influence others to do what one wants, to supervise and direct the actions of others, to tell others how to do their jobs.
10. aba Abasement: To feel guilty when one does something wrong, to accept blame when things do not go right, to feel that personal pain and misery suffered does more good than harm, to feel the need for punishment for wrong doing, to feel better when giving in and avoiding a fight than when having one's own way, to feel the need for confession of errors, to feel depressed by inability to handle situations, to feel timid in the presence of superiors, to feel inferior to others in most respects.
11. nur Nurturance: To help friends when they are in trouble, to assist others less fortunate, to treat others with kindness and sympathy, to forgive others, to do small favors for others, to be generous with others, to sympathize with others who are hurt or sick, to show a great deal of affection toward others, to have others confide in one about personal problems.
12. chg Change: To do new and different things, to travel, to meet new people to experience novelty and change in daily routine, to experiment and try new and different jobs, to move about the country and live in different places, to participate in new fads and fashions.

13. end Endurance: To keep at a job until it is finished, to complete any job undertaken, to work hard at a task, to keep at a puzzle or problem until it is solved, to work at a single job before taking on others, to stay up late working in order to get a job done, to put in long hours of work without distraction, to stick at a problem even though it may seem as if no progress is being made, to avoid being interrupted while at work.
14. het Heterosexuality: To go out with members of the opposite sex, to engage in social activities with the opposite sex, to be in love with someone of the opposite sex, to kiss those of the opposite sex, to be regarded as physically attractive by those of the opposite sex, to participate in discussions about sex, to read books and plays involving sex, to listen to or to tell jokes involving sex, to become sexually excited.
15. agg Aggression: To attack contrary points of view, to tell others what one thinks about them, to criticize others publicly, to make fun of others, to tell others off when disagreeing with them, to get revenge for insults, to become angry, to blame others when things go wrong, to read newspaper accounts of violence.

APPENDIX D: CORRELATION MATRIX

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Table 9. Correlation matrix<sup>a,b</sup>

Variables <sup>c</sup>	1	2	3	4	5	6	7	8	9	10	11	12													
1	.																								
2	05	.																							
3	08	15	.																						
4	-21	-06	00	.																					
5	27	-08	-09	-49	.																				
6	28	01	07	-27	67	.																			
7	29	-03	-05	-42	76	55	.																		
8	12	08	11	-02	04	13	19	.																	
9	02	20	-10	-01	-13	-10	-04	-04	.																
10	09	06	-03	05	-15	-12	-12	-09	28	.															
11	-12	-11	02	10	08	12	16	17	-17	-32	.														
12	03	-22	-18	-04	14	03	13	12	-12	-21	13	.													
13	-05	15	-01	-06	01	-02	-06	-28	08	-10	-12	-27	.												
14	-01	-02	05	-07	10	-08	04	-15	04	-02	-24	-08	-08	.											
15	-06	-14	16	-02	06	08	-06	-01	-15	-17	05	-07	-07	-07	.										
16	-06	13	-04	05	07	-01	09	07	-11	-01	05	-05	-05	-05	-05	.									
17	-01	02	-06	-05	-17	-08	-23	-31	14	09	-27	-13	-13	-13	-13	-13	.								
18	-08	12	04	06	-09	-10	-21	-27	-03	-07	-30	-37	-37	-37	-37	-37	-37	.							
19	09	-22	-05	-07	-09	-05	-04	-13	-06	-24	-03	13	13	13	13	13	13	13	.						
20	13	11	07	06	-12	-08	-11	01	19	41	-38	-19	-19	-19	-19	-19	-19	-19	-19	.					
21	-07	-01	-03	07	05	09	06	01	-36	-26	27	-04	-04	-04	-04	-04	-04	-04	-04	-04	.				
22	-03	-18	-02	03	17	16	18	02	-30	-32	29	25	25	25	25	25	25	25	25	25	25	.			
23	09	-01	20	02	-01	-04	-12	-06	07	-05	08	-04	-04	-04	-04	-04	-04	-04	-04	-04	-04	-04	.		
24	09	12	23	-02	04	03	03	-02	01	13	-05	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14	.	
25	16	-07	15	15	-10	06	-11	-08	-02	-08	-02	-05	-05	-05	-05	-05	-05	-05	-05	-05	-05	-05	-05	-05	.

<sup>a</sup>Correlations without decimals.

<sup>b</sup>N varies from 126 to 264. Tests of significance were conducted using the smallest value for N, which was 126.

<sup>c</sup>1 = GPA; 2 = satisfaction with college; 3 = job satisfaction; 4 = HSR; 5 = ACT; 6 = OTIS; 7 = MSAT; 8 = ACH; 9 = DEF; 10 = ORD; 11 = EXH; 12 = AUT; 13 = AFF; 14 = INT; 15 = SUC; 16 = DOM; 17 = ABA; 18 = NUR; 19 = CHG; 20 = END; 21 = HET; 22 = AGG; 23 = SALARY; 24 = COOP work experience was of benefit on the first job; 25 = Number of dependents.

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13 14 15 16 17 18 19 20 21 22 23 24 25

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