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An Exploratory Study of Holland's Theory of Vocational Choise and Rotter's Social Learning Theory

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AN EXPLORATORY STUDY OF HOLLAND'S THEORY OF VOCATIONAL CHOICE AND ROTTER'S SOCIAL LEARNING THEORY

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ABSTRACT

Purpose

The purpose of this study was to explore the relationship between Holland's theory of vocational choice and Rotter's social learning theory. More specifically, it was aimed at examining the interplay between internal-external locus of control and consistent and inconsistent vocational patterns to determine whether the apparent differences between personality theory and vocational choice theory could be reduced.

Subjects

The subjects were 493 freshmen males who entered the University of North Dakota during the Summer or Fall of 1967, participated in the Orientation Program, and completed one semester of course work. In accordance with the experimental design 474 subjects of the original sample were used for a two way analysis of variance and 365 subjects for a three way analysis of variance.

Procedure

All of the subjects received the Strong Vocational

Interest Blank, James's I-E Scale, and the American College Tests as part of the Freshman Orientation Program. To determine consistent and inconsistent vocational patterns each subject's Strong Vocational Interest Blank profile was re-grouped according to Holland's six vocational categories. Mean standard scores were then computed for each category. Primary and secondary patterns were determined by finding the first and second highest mean score among the six categories. These were then compared to Holland's "hexagonal model" to determine whether they represented consistent or inconsistent vocational patterns. James's I-E Scale was used as a measure of internal-external locus of control, while the American College Tests served as an index of academic ability. Ten hypotheses were developed. Of these, three dealt with the relationship among consistent and inconsistent vocational patterns, academic ability, and internal-external locus of control, and were tested by a two way analysis of variance, where I-E scores represented the dependent variable. The remaining seven hypotheses examined the relationship among vocational patterns, locus of control, academic ability and academic performance, the latter representing the dependent variable in a three way analysis of variance.

Principle Findings and Conclusions

Contrary to expectations there appeared to be little empirical relationship between Rotter's social learning theory and Holland's theory of vocational choice, despite the similarities which seemed to exist at a theoretical level.

Academic ability differentiated between internally and externally controlled individuals, lending support to prior studies. Similarly, internals and high ability students achieved significantly higher grades than externals and low ability students. No significant difference was found between vocationally consistent and vocationally inconsistent subjects in terms of academic achievement. No interaction was found among the variables and academic performance.

Summary

Whereas academic ability was related to locus of control, no relationship existed between vocational patterns and this construct. In terms of academic achievement, significant differences were found for locus of control and for academic ability, but not for vocational patterns.

CHAPTER I

INTRODUCTION

The present study was designed to explore some theoretical, empirical, and practical implications of Holland's (1966b) theory of vocational choice and Rotter's (1954) social learning theory. More specifically it was aimed at disclosing the interplay, if any, between these two theoretical positions using the Strong Vocational Interest Blank (SVIB) and James's Scale of Internal-External Locus of Control (I-E Scale).

Background of the Study

Although Rotter's social learning theory and Holland's theory of vocational choice have emerged from different sources and for different purposes, the two theories did not appear to be mutually exclusive and, in fact, seemed to complement each other when viewed under certain circumstances. Stated another way, it was believed that the theories could conceivably provide a common meeting ground between theories of personality and theories of vocational choice, something which Campbell (1966, p. 50) felt should

be done. As he stated it "personality theorists have neglected the field of interest, or have treated the subject as superficial and capricious." Similarly, Super and Crites (1962, p. 377) contended that "Clinical psychologists have tended to devote their energies to intelligence and personality."

This tendency, on the other hand, was not manifested in the literature dealing with vocational choice and interests. Indeed, quite the contrary was true. According to Super (1949, p. 402), for example, Carter's paper, dating as far back as 1940, addressed itself to the very problem of the relationship between personality and vocational choice. Shortly after, Darley (1941), Bordin (1943), and Berdie (1943), followed suit. Later, the list grew impressively to include such names as Super (1953; 1957; 1963), Roe (1956; 1964), Tiedeman and O'Hara (1963) etc. Thus, the period from 1940 to 1960 was characterized by theory building. Of greater importance from the standpoint of the present study, however, was the fact that each theory either implicitly or explicitly stresses the inseparability of vocational choice and personality. As Holland (1966b, p. 3) has so emphatically stated it "vocational interests are simply another aspect of personality."

A logical extension to this position seemed twofold. First, personality theories should be flexible enough to permit the inclusion of vocational interests, or, at least, to reflect the kind of interdependence with theories of vocational choice and interests that Holland has suggested. And second, instruments developed for one theoretical area should be equally adaptable, in a utilitarian sense, to the other.

Two theories which appeared suitable for exploring these assumptions and for bringing the knowledge of the two fields closer together are those of Rotter (1954) and Holland (1966b). The basic tenets of Rotter's work have received sufficient treatment elsewhere (Rotter, 1954, 1966; Lefcourt, 1966), but two essential personality or behavioral variables, internal and external locus of control, warrant brief consideration.

In a general way the two terms, internal and external locus of control, represent opposing perceptual or belief systems concerning an individual's sense of mastery over events in his life. Individuals who see themselves as receiving reinforcement because of "luck," or "chance," or "fate," and not completely because of their own actions, are said to believe in external control. Those who interpret

the reinforcement as contingent upon their actions are said to believe in internal control. Further, the constructs refer to expectancy, not to motivation, and are generalizable so that it is possible to speak of individual differences in terms of the two constructs. That is, the expectation that reinforcement is, or is not, dependent upon one's behavior will manifest itself in many situations, thus typing, in a loose sense, the individual as either internally or externally controlled in relation to his environment.

Holland (1966b, p. 9), on the other hand, begins with "vocational types" which he sees as models "against which we can measure the real person." In addition, the vocational type, since it represents a habitual mode of coping with social, psychological, and vocational tasks is really no less than a personality type, reflecting as Holland (1966b, p. 10) stated, "a complex cluster of personal attributes." In all Holland proposes six categories including the (1) Realistic, (2) Intellectual, (3) Social, (4) Conventional, (5) Enterprising, and (6) Artistic types. A two way coding system (Holland, 1966b, p. 40) gives the theory greater depth insofar as it permits the pairing of the six categories. Thus, an individual might, for the most part, share those attributes describing the Realistic

type, but, in addition, share some of the characteristics associated with the Conventional type. The code number 1,4 would then describe more completely the individual.

Moreover, the code provides a psychological "stability index," similar, as Holland (1966b, p. 44) sees it, to Festinger's concept of dissonance and to a measure of ego strength. For the most part the index refers to the degree of consistency between the individual's primary and secondary type, but it can also refer to the compatibility between the individual's personality and environmental type. In the former case, a consistent pattern exists when the primary and secondary types overlap considerably in terms of the attributes or behavior belonging to each. Thus, in a case which combined the Realistic and Conventional types, a stable pattern exists because these two types share similar attributes. Conversely, a Realistic-Social pattern, or 1,3 arrangement, is said to be inconsistent or unstable because the characteristics of each conflicts with the other. The same explanation holds for vocational type and environmental model. In other words consistent patterns exist when the individual chooses a job which is compatible with his personality type.

Holland speculates further that consistent and

inconsistent patterns will lead to differences in several areas of life. As would be expected the consistent patterns should represent a well integrated individual with concomitant successes in his educational and occupational undertakings. As Holland (1966b, p.47) stated it, "A consistent personality makes for effective functioning." Such a person would enjoy, among other things, greater job satisfaction and stability, demonstrate higher occupational and educational achievement, have greater aspirations which, at the same time would be more realistic, and be less influenced by external forces than the inconsistent person. Conversely, inconsistent vocational patterns lead to limited success or failure in terms of the listed criteria. That is, vocationally inconsistent individuals would enjoy less job satisfaction, be more unstable, both emotionally and occupationally, fair less well academically, be more influenced by external pressure and so on (Holland, 1966b, pp. 42-49).

Since Rotter's externally controlled individuals are, by definition, more sensitive to external forces than internals and since they do less well academically (James, 1965), these two criteria, academic achievement and the effects of external pressure, held considerable importance

for the present study because they appeared to offer an excellent vantage point, empirically speaking, for investigating the relationship between the theories of Rotter and Holland. In other words it seemed conceivable that Rotter's internally controlled individual and Holland's vocationally consistent individual could bear a resemblance to one another, while similarities between externals and vocationally inconsistent individuals might exist.

Statement of the Problem

In a global way, the purpose of this paper was to examine aspects of Holland's and Rotter's theories to determine whether the empirical and theoretical distance which seemed to exist between most personality theories and theories of vocational choice could be reduced. In particular, this research was directed at disclosing the nature of the inter-dependence, if any, between consistent-inconsistent patterns and internal-external locus of control. To further the research a significance level of .05 was established and null hypotheses were developed as follows:

1. There is no significant difference between consistent and inconsistent vocational patterns in terms of internal-external locus of control.

2. There are no significant differences in terms of internal-external locus of control among

individuals with low, medium, and high academic ability.

3. There is no significant interaction in terms of internal-external locus of control between consistent-inconsistent vocational patterns and academic ability.

4. There is no significant difference in academic achievement between individuals with low or high academic ability

5. There is no significant difference in academic achievement between individuals with low or high internal-external locus of control.

6. There is no significant difference in academic achievement between individuals with consistent or inconsistent vocational patterns.

7. There is no significant interaction between consistent-inconsistent patterns and academic ability in terms of academic achievement.

8. There is no significant interaction between consistent-inconsistent vocational patterns and internal-external locus of control in terms of academic achievement.

9. There is no significant interaction between internal-external locus of control and academic ability in terms of academic achievement.

10. There is no significant interaction among consistent-inconsistent vocational patterns, academic ability, and internal-external locus of control in terms of academic achievement.

Delimitations of the Study

The study was confined to an original sample of 493 freshmen males at the University of North Dakota who enrolled during the academic year 1967-1968 and

participated in the Freshmen Orientation Program. From this sample 474 subjects were used for the two way analysis of variance and 365 subjects for the three way analysis of variance.

Limitations of the Study

1. The study was limited to the extent that the SVIB can be used to empirically represent Holland's theory of vocational choice.

2. The study was limited to the extent that the I-E Scale empirically represents a generalized expectancy for internal or external locus of control.

3. The study was limited to the extent that the American College Test (ACT) serves as a measure of academic ability.

4. The study was limited to the extent that the method of determining consistent and inconsistent vocational patterns is actually adequate in terms of Holland's (1966b) theory.

5. The study was limited to the extent that the method of determining primary and secondary patterns on the SVIB is adequate in terms of Holland's (1966b) theory.

Significance of the Study

As indicated earlier the theoretical implications of the study held considerable importance since the primary emphasis of the research was placed on examining the interdependence of vocational choice theory and personality theory in the hope that a more comprehensive knowledge of each could be gained, and greater similarity between the two fields might be revealed.

However, the study did leave room for some possible practical significance. More light might be shed on further uses of the SVIB and the I-E Scale, especially with regard to their use by counseling and clinical psychologists as they work with students or other individuals faced with educational or occupational choice. Certainly, as Chin (1967) has stated: "Clinical and counseling psychology are coming closer and closer together, whether each of these disciplines likes it or not." Thus, it seemed self-evident that both of these specialties could benefit from instruments which were equally adaptable to both fields.

Definition of Terms

1. Academic Ability (AA): Academic ability for hypotheses 1-3 represented the individual's composite score on the ACT. Low academic ability (LA) then, designated the bottom one-third of those scores compared to the other

University of North Dakota freshmen males included in the sample. Medium academic ability (MA) reprented the middle one-third of these scores and high academic ability (HA) represented the upper one-third of these scores. For hypotheses 4-10, ACT scores between the 45th and 55th percentile were eliminated and scores below the 45th percentile were designated low ability (LA), scores above the 55th percentile high ability (HA).

2. Academic Achievement (AAch): Academic achievement refers to the individual's cumulative grade point average at the end of his first semester.

3. Primary Pattern (PP): The occupational category according to Holland's theory, having the highest mean score on the SVIB.

4. Secondary Pattern (SP): The Occupational category, according to Holland's theory, having the second highest mean score on the SVIB.

5. Consistent Patterns (CP): Consistent patterns or codes denote the compatibility between the primary and secondary patterns according to Holland's theory.

6. Inconsistent Patterns (IP): Inconsistent patterns or codes denote the incompatibility between the primary and secondary patterns according to Holland's theory.

7. Internals (Is): Internals represented those individuals who scored below the 45th percentile compared to other University of North Dakota freshmen in the sample on James's Scale of Internal-External Locus of Control.

8. Externals (Es): Externals represented those individuals who scored above the 55th percentile on James's Scale of Internal-External Locus of Control compared to other University of North Dakota freshmen in the sample.

Organization of the Study

The remainder of the dissertation is organized into the following chapters: Chapter II contains a review of the literature pertinent to this investigation; Chapter III contains a description of the population used, a description of the instruments employed, and a discussion of the method and statistical design used; Chapter IV contains the results of the investigation; and Chapter V contains a discussion of the conclusions and recommendations drawn from the research. References are entered at the end of the dissertation.

CHAPTER II

REVIEW OF RELATED LITERATURE

The number of studies dealing with vocational choice and interests was virtually overwhelming. This was also true of research designed to investigate the relationship between vocational interests and personality, or psychological needs. At the same time, as mentioned earlier, theories of vocational choice and development, and speculation concerning the origin and development of vocational interests have increased considerably over the past three decades. On the other hand, research related to Rotter's theory was less apparent for studies related to vocational choice or interests. To compensate for this imbalance and thereby present a more coherent review of the literature this chapter was organized according to the following subject areas: (1) Studies of vocational choice and interests, particularly those employing the SVIB, and personality measures; (2) studies of vocational choice and interest and educational achievement; (3) studies dealing with internal-external locus of control and; (4) studies

dealing with vocational choice or interest and internal-external locus of control.

Relationships Between Vocational Choice or Interests and Personality

An examination of the literature under this rubric indicated that no simple, definitive statement exists about the relationship between vocational choice or interest, and personality. While some studies tended to confirm the notion that these areas were related others did not.

Segal (1961), for example, working within a psychoanalytic model, attempted to predict personality differences for individuals choosing either accounting or creative writing as an expression of vocational preference. His sample was restricted to 15 advanced students at the University of Michigan in the former discipline and 15 in the latter. The sample included only accounting students who had received a letter score of A or B+ on the Accountant scale of the SVIB, and creative writing students who had received a B- or lower on the same scale. To establish the psychological needs of the two groups, each student was administered a modified Rorschach, which limited responses to five per card, and the Bender-Gestalt, and each was asked to write a one page vocational autobiography.

Segal found that: (1) There were no differences between the two groups in terms of general adjustment; (2) Creative writing students displayed stronger expressions of hostility than accounting students; (3) While accounting students were more rigid and had more fearful identification than creative writing students, the latter group tended to seek the completion of multiple identifications. Segal was unable to conclude however, that differences existed between the two groups in terms of acceptance of social norms, degree of emotional control, or awareness of feelings, frequency of compulsive defenses, and tolerance for ambiguity.

Bohn (1966), reflecting an attitude reminiscent of the present study, contended that "only vague and tentative statements" have been made "about the relationships between vocational interests and other personality measures." In an attempt to rectify this, Bohn investigated the relationship between the SVIB and the Adjective Check List. He used, however, only six occupational scales from the SVIB, each representing one of Holland's (1959) personality types in the following manner: Realistic (Printer), Intellectual (Chemist), Social (Social Science High School Teacher), Conventional (Accountant), Enterprising (Sales Manager) and Artistic (Artist). The Adjective Check List was scored

according to Heilbrun's scales based on 15 manifest needs from Murray's personality theory, and a defensiveness scale.

Although the results were too exhaustive for total inclusion in the present discussion, one bore a striking resemblance to Segal's (1961) research cited above, and consequently seemed worthy of at least partial mention. For instance, whereas Segal was unable to substantiate his assumption that accounting students would demonstrate a greater frequency of compulsive defenses than creative writing students, Bohn established that defensiveness was directly related to Conventional (Accountant) types and inversely related to Artistic (Artist) types. Bohn concluded that his study underscored "the relationship between psychological needs and vocational personality types."

Other investigators have shared Bohn's optimism to the extent that their findings supported their belief that personality and vocational interests or choice were related. Irvin (1968) compared art and architecture students on the basis of their responses on a sentence completion test. He concluded that it was possible, contrary to Roe's position, "to predict personality differences" between artists and architects. In a rather ambitious study, Goldschmid (1967)

used both the male and female forms of the SVIB, along with several personality characteristics. Dividing college majors into two broad categories, Science and Humanities, and developing regression equations for each test, Goldschmid resolved that "particular personality patterns are indeed associated with educational choice." In addition, he felt that the humanities equation for the male SVIB was extremely effective in predicting future majors. Since Holland (1966a) has already presented a scheme for matching college majors and occupations, Goldschmid's study was therefore considred relevant to the present investigation.

Another study, deemed highly significant in terms of the present research, was conducted by Osipow and Gold (1967). These researchers examined the variables related to inconsistent career preferences. More specifically, the authors were concerned with such factors as "parental pressures, health and physical differences, unusual intra-individual discrepancies in abilities, and personality characteristics" which might have created conflict for the adolescent and subsequently led to inconsistencies in the individual's occupational preferences. Unlike the present study, Roe's (1956) classification system and not Holland's (1966b) was used to determine inconsistent

patterns. And, instead of the SVIB, a Personal Information Blank, administered to all freshmen prior to enrollment, provided the researchers with the first and second career preferences which were two to four categories apart according to Roe's scheme. The consistent sample included students whose first and second preference were zero to one category apart. The SVIB was used to examine the degree of support for the vocational preference of the subjects and three selected scales of the Bernreuter Personality Inventory were employed to examine personality differences between the two groups. A comparison of academic ability and a comparison of the discrepancy between verbal and quantitave ability between the two groups was carried out using the Scholastic Aptitude Test. The rest of the information for comparison, including curricular enrollment, health, and parental support, was gleaned from each subject's Personal Information Blank. The results of the study indicated that the consistent and inconsistent groups could be differentiated according to dominance, one of the three personality characteristics considered. The other scales on the Bernreuter, stability and self-sufficiency, demonstrated no significant difference between the two groups. Similarly no significant differences were found between the groups

for familial or personal maladjustment, for familial support for occupational plans, for health or physical problems, for discrepancy between verbal and quantitave scores, or for degree of SVIB support for first occupational preference. Significant differences were found between the groups in terms of verbal ability. The consistent group scored significantly higher on this criterion measure than the inconsistent group. The investigators concluded therefore that the consistent group was better prepared academically. In general however the results somewhat clouded the issue under investigation in the present study, since neither the SVIB nor the Bernreuter Personality Inventory were categorically associated with career preference inconsistency.

This type of ambiguity however, was not confined to the above mentioned study. Indeed, as stated earlier in this chapter, many investigations confounded the relationship between vocational choice or interest, and personality. For example, Klein, McNair, and Lorr (1962), Aalto (1959), Dunnette, Kirchner, and De Gidio (1958), Thomas (1958) Blum (1947), and Cottle (1949), in an oft cited article, found little or no relationship between the two areas. In view of such confusion, Seiss and Jackson (1967), and

Thorndike, Weiss, and Dawis (1967) proposed that inadequate statistical measures could have accounted for much of the trouble. Both research teams studied the problem using more sophisticated statistical procedures. Thorndike, Weiss, and Dawis employed the technique of canonical correlation, while Seiss and Jackson used a multi-method factor analysis "to overcome the effects of intruding method variance," and studied the factors common to the SVIB, Minnesota Multiphasic Personality Inventory, Bernreuter Personality Inventory, and Kuder Preference Record. In all, seven common factors were found in the latter study. There were (1) a bipolar factor described best as "Things vs. People," (2) a social service factor, (3) a bipolar factor described as "Impulse Control and Expression," (4) a practical dimension, (5) an authority or management division, (6) an intellectual and aesthetic dimension, and (7) a social contact factor.

Kristjanson (1969), in an unpublished Master's thesis, apparently benefited from the admonitions of Seiss and Jackson. He approached the question of Holland's personality types and hypothesized attributes using several different statistical methods and established several significant differences among Holland's six occupational types and

their psychological needs, according to the Edwards Personal Preference Schedule.

In summary then, much of the research pointed to an interdependence of vocational interests or choice and personality charcteristics. But, the evidence was far from conclusive and left room for further research and further speculation, especially if, as Seiss and Jackson (1967) have suggested, theories of vocational interests are to be rooted in personality theory.

Vocational Interest or Choice and Educational Achievement

Darley and Hagenah (1955, p. 57), after reviewing the literature, concluded that there was a low relationship between measured interests and academic achievement. More recently however, Campbell (1966, p. 47) stated that "it is possible to measure success directly if that is what one sets out to do." Moreover, he felt that most of the work done thus far with the SVIB has concerned itself with occupational persistence and not occupational success. To support this stand Campbell (1966, p. 47) cited the successful work of Stone (1960), and Ferguson (1958, p. 190) in this area. Other researchers have also been successful.

Lande (1958), for instance, found differences in

interests among freshmen students when they were divided into inferior, average, and superior categories of scholastic achievement. Interests in this case referred to a measure obtained on a 62 item inventory. Lande found that superior students preferred academic subjects, cultural activities and scientific hobbies, while inferior students enjoyed sports, games, and social activities.

In an earlier, but better designed study than the one just cited, Maier (1957) combined high school grade point averages and both the Kuder Preference Record and the SVIB for the purpose of making a differential academic prediction. Maier determined that the SVIB served as a better predictor than the Kuder Preference Record and that the SVIB plus the other predictor variables worked best in engineering.

Similarly, Melville and Frederiksen (1952) studied 93 entering students of engineering at Princeton University. The SVIB was administered over a two-year period. Standard scores on the SVIB for each scale were correlated with freshmen grade point averages and with adjusted grade averages. Average engineering students were found to have relatively high interest for activities associated with occupations stressing scientific work, business, and

administration scales. Eight of the correlations between grade point average and SVIB scales were signficant at the .05 level or better and suggested that academic success for this sample was directly related to interest in activities associated with men in scientific occupations and inversely related to interests associated with business detail and sales.

On the other hand, Darley and Haganah's (1955) position, mentioned at the outset of this Chapter, was partially supported even in terms of a more recent review of the literature. Cooper (1954) found the SVIB to be a rather poor predictor of grade point average. Likewise, Hewer (1954) examined the interrelationship among vocational interests, achievement, and ability, using 296 pre-medical students at the University of Minnesota as subjects. She found that the SVIB did not contribute signficantly to the final regression equation. Motto (1959), using scores on the Kuder Preference Record in an attempt to predict success in vocational school, found that none of the scales could be used to differentiate successful from non-successful students.

On the whole, fewer studies were found which related personality variables and vocational interests to educational

achievement. A study by Rodgers (1959) did, but met with modest success. Rodgers employed the SVIB, Edwards Personal Preference Schedule (EPPS), and Borow's College Inventory of Academic Adjustment and related these tests to the grade point average over two quarters for 100 freshmen at the Department of Printing at the Rochester Institute of Technology. High achievers obtained significantly higher scores on the endurance scale of the EPPS and SVIB printer scale; lower achievers obtained signficantly higher scores on the EPPS affiliation scale.

In summary then, there was still some confusion surrounding the role of vocational interests and educational achievement. Nevertheless, Campbell's (1966, p. 47) contention, quoted earler, gained increasing support over the past few years. Conspicuous in their relative absence were studies which dealt with both personality and vocational interests as they relate to scholastic achievement.

Internal-External Locus of Control

Rotter (1966) and Lefcourt (1966) have each presented a comprehensive review of the literature dealing with internal-external locus of control as a personality construct. Rotter indicated that the I-E Scale has demonstrated significant differences among social classes

(Battle and Rotter; 1963), the higher socio-economic class favoring internality. Political and social involvement has also been examined. Negro students who were willing to become involved in civil rights movements showed a greater degree of internal control than those who would not (Gore and Rotter, 1963). A cross cultural study cited by Rotter (1966) indicated that union membership, union activity, and knowledge of political affairs were all related to internality. Comparisons between smokers and non-smokers (Straits and Sechrest; 1963) and between those who continued and discontinued to smoke after the Surgeon General's Report (James, Woodruff, and Werner; 1965) demonstrated that non-smokers and those who quit were more internal than smokers and those who continued smoking. Achievement motivation has also, by and large, been positively related to internality (Franklin; 1963, Rotter and Mulry; 1965).

Green, Lotsof, and James (1964) utilized an Asch-type experimental situation and studied conforming and non-conforming behavior in terms of I-E control among 120 students enrolled in an introductory psychology course at Northern Illinois University. The subjects were divided into two groups, representing the top and bottom

third of the distribution of scores on the I-E scale. Each subject was placed in a group with four confederates and was first asked to judge which of two lines corresponded to a standard line. Next, the subject was requested to place a bet on his judgement to measure the degree of confidence he had in it. Bets were made for 25 cents, 50 cents, 75 cents, or one dollar. Each subject was informed that the individual amassing the most money over 15 trials would be the winner. When his judgement was correct he received the amount bet and when incorrect he lost this amount. A critical trial occured when the four confederates responded incorrectly.

The results indicated that the externals were more conforming than the internals on the 12 critical trials. The internals also bet more than their external counterparts, but this was not statistically confirmed. This study seemed especially relevant to the present study inasmuch as Holland (1966b, p. 45) has indicated that individuals with inconsistent patterns also are susceptible to external influences.

James (1965) has also spoken of the positive relationship between internality and scholastic performance. An explanation of this evidence, James felt, rested on the

fact that "internals on the I-E Scale, as opposed to externals, tend to be more reactive to cues and reinforcements in a learning situation." He stated further that internals "respond to reinforcement in a more consistent and accumulative manner," and consequently "generally show more rapid learning; are less variable in their learning than externals; are better at generalization and discrimination tasks and are more resistant to extinction."

In light of the above research and theory the rationale behind the present research seemed justifiable. In short, the empirical evidence underlying Rotter's (1954) theory appeared to be more than superficially related to Holland's (1966b) position.

Internal-External Locus of Control and Vocational Interests

There was a paucity of research conducted under this heading. Zytowski (1967) studied the relationship of internal-external locus of control and the SVIB. Zytowski used 62 male undergraduates at Iowa State University who had taken the I-E Scale and SVIB in freshmen orientation or as part of their contact with the Counseling Service. He found ten significant correlations between

the I-E Scale and 50 variables from the SVIB. Generally speaking, Zytowski's study indicated a positive correlation between "aesthetic" or "feminine" occupations, including artist, musician, and author-journalist, and external locus of control. Conversely, math-science teachers, school superintendant, accountants, and sales manager related negatively to the I-E Scale, indicating that individuals in these occupations would tend to be internally controlled. However, since other scales such as personnel director and manufacturing president showed no similarity to these areas, Zytowski only tentatively advanced the notion that the label "administrator" could be loosely related to internal locus of control.

CHAPTER III

METHOD OF THE STUDY

Chapter III is divided into three parts. The first section describes the sample. The second section includes a description of the instruments used, and the third part explains the method, research design, and statistics employed.

Subjects

Subjects for this study were 493 freshmen males who entered the University of North Dakota during the Fall or Summer of 1967, completed the necessary tests and completed one semester of course work.

Instrumentation

Three tests were used in the present study. These were; the Strong Vocational Interest Blank, James's Scale of Internal-External Locus of Control, and the American College Tests. Each subject received these tests as part of the freshmen orientation program. In addition to these three tests each subject's cumulative grade point

average for the first semester of his freshman year was used as an index of academic performance and was made available through the Registrar's Office at the University of North Dakota.

American College Tests

The American College Tests was constructed primarily to predict success in college (ACT 1965 Technical Report). The test includes four sub-tests, English usage, mathematics usage, social studies reading, and natural sciences reading, and a composite score which is arrived at by averaging the scores from the four sub-tests. For the purpose of this study, the composite score was used as an index of academic ability.

Engelhart reviewed the ACT in Buros' (1965) Sixth Mental Measurement Yearbook, and reported a reliability of .95 for the composite score for a sample of 990 high school seniors. This figure corresponds to that reported in the ACT 1965 Technical Report.

A study cited by Eide (1969) indicated that the correlation between ACT scores and grade point average for 1,137 students at the University of North Dakota was .55. Cronbach (1960, p. 115) has indicated that it is "unusual for a validity coefficient to rise above .60," and that

although the higher coefficients would be desirable "any positive correlation indicates that predictions from the test will be more accurate than guesses." It appeared then that both in terms of reliability and predictive validity the ACT composite score represented a suitable measure of academic ability for this study.

James's Scale of Internal-External Locus of Control

The I-E Scale, or as it is sometimes called for disguise purposes "The DeKalb Survey Test - Form I-E - 1," is a slightly modified version of an original scale developed by James (1957). Essentially, it reflects the theoretical position of Rotter (1954) and previous work of Phares (1955). The test provides, as the author points out in the scoring directions (James, 1963), "a measure of the extent to which a person perceives events as determined by factors extrinsic to himself such as fate, chance and the manipulations of others (external control) versus the extent to which the individual perceives events as determined by factors intrinsic to himself (internal control)."

The scale consists of 60 items. Subjects must either Strongly Agree (SA), Agree (A), Disagree (D), or Strongly Disagree (SD) with each. The responses receive weighted values of 3, 2, 1, and 0 respectively. Since only the

even numbered items (3) are scored, the remaining 30 serving as "filler," a total score of 0 to 90 is possible. James (1963) pointed out, however, that the actual range usually falls between 8 to 82 with college populations commonly having a mean of 37, and a standard deviation of 12. Low scores indicate internal control and high scores external control.

James (1963) has reported that split-half reliabilities ranging from .84 to .96, and test-retest reliabilities ranging from .71 to .86, over a one year period, and a three month period respectively, have been found. While James (1963) does not report validity coefficients for his scale, earlier studies cited by Rotter (1966) indicate that the discriminant validity of parallel tests is moderately high since the scales show only modest to low correlations with several criteria. Rotter (1966) reports for instance that correlations ranging from -.07 to -.35 between the I-E Scale and the Marlow-Crowne Social Desirability Scale have been found. Similarly, low correlations between the I-E Scale and measures of intellectual ability have been found to range from -.22 to .01. Sex differences also appear to be minimal. In terms of construct validity, which Rotter (1966) states "comes from predicted differences in behavior for

individuals above and below the median of the scale or from correlations with behavioral criteria," the scales appear to support the hypothesis that internals are likely to "(a) be more alert to those aspects of the environment which provide useful information for his future behavior; (b) take steps to improve his environmental condition; (c) place greater value on skill or achievement reinforcements and be more concerned with his ability, particularly his failures; and (d) be resistive to subtle attempts to influence him." Conversely externals would be characterized by opposite behavior. Thus, in terms of its reliability and validity the I-E Scale appeared to be an appropriate instrument in terms of Rotter's (1954) theory and the proposed task.

Strong Vocational Interest Blank

Although Astin (1965, p. 1071) recognized some of the shortcomings of the SVIB, he nevertheless stated that it "remains as the best constructed and most thoroughly validated instrument of its kind." Agreement with this statement was not difficult to find. Super and Crites (1962, p. 418), for example, stated that the SVIB "is without question one of the most thoroughly studied and understood psychological instruments in existence."

Perhaps what spoke best for the test however was its continuous use by psychologists over a period of some 42 years, which called for several revisions, and its lofty position as a much used research tool.

The latest revision of the SVIB (Campbell; 1966), which was used in this study, consists of 399 items. The items demand, for the most part, a "like," "indifferent," or "dislike" response. Each response carries a different weighted value for each occupational scale according to the similarity shared with the norm group for that occupation. The occupational group is distinguished from men in general. The profile presents standard scores for each occupational scale and these are converted to letter scores of A, B+, B, B-, C+, and C, to facilitate interpretation. Thus, an individual who receives a letter score of A or B+ can be said to be highly similar and similar respectively to people in that occupation. Conversely a B-, C+ or C represents a reject score, meaning that the individual is dissimilar to and highly dissimilar to people in that occupation. A score of B means that the individual share some interests with the individuals in that occupation.

The reliability of the SVIB appeared sufficiently

high to make it a useful instrument for this study. Super and Crites (1962, p. 430) reported an average odd-even reliability of .88 for all the scales except CPA which was .73. Campbell (1966) reported on the test-retest reliabilities over 2 weeks, 30 days, 3 years, 8 years, 22 years, and 30 years. Median correlations of .91, .91, .68, .61, .67, and .56 were found respectively for these test-retest periods.

The concurrent and predictive validities of the SVIB have received considerable attention. Speaking of concurrent validity, Campbell (1966, p. 32) has said: "The occupational-interest scales were devised to distinguish members of occupational groups from people-in-general. To establish the validity of these scales, it is necessary to show that they do indeed separate these groups." To test the ability of the SVIB scales to accomplish this, Campbell (1966, p. 33) used a "per-cent overlap" suggested by Tilton (1937). The results are too extensive for discussion here but they do indicate, that the test successfully separates the groups, the median overlap being only 31 percent.

Some authors have questioned the predictive validity of the scales primarily because of the "base rate" used in predicting entrance into an occupation. Reacting to

the notion that an individual with a B rating has a 50-50 chance of actually entering that occupation (Strong; 1955), Astin (1965, p. 1070) has stated that "The reader should have been told that these conclusions assume a 50-50 base rate in the population (which is, of course, seldom the case for a single occupation in any population)." Dolliver (1969) has taken exception to the idea, again advanced by Strong (1955, p. 54), that an individual with an A rating on a scale has a 3.5 to 1 chance of entering that occupation. In defense of Strong's position Campbell (1969) has conceded that the base rate for prediction requires clarification, but he also pointed out that "the predictive ratio based on students from Stanford, Minnesota, Missouri, and Harvard has hovered about 3 to 1" which led him "to conclude that about three-quarters of the white collar workers in our society are in occupations that are reasonably consonant with their inventoried interests as young adults."

In summary then, despite some confusion regarding its predictive validity, the SVIB stood, in terms of its reliability and concurrent validity, as a highly suitable instrument for the present study. Furthermore, because it has been derived from empirical studies and not from a

particular theoretical position (Cronbach, 1960, p. 406), the SVIB should not present any theoretical conflict with Holland's (1966b) theory.

Classification Schema

To accomodate the SVIB profile to Holland's theory, the profile was divided into six categories corresponding to Holland's six vocational types and following the occupational classification recently suggested by Holland et al. (1969, pp. 6-11). Whenever the SVIB occupational scales were not included in this classification Holland's (1966b, p. 37, pp. 109-116) earlier system was used. Thus, employing this new system the SVIB occupational scales architect, engineer, carpenter, forest service man, farmer, and printer represented Holland's Realistic type in the present study. Dentist, osteopath, veterinarian, physician, psychiatrist, biologist, mathematician, physicist, chemist, army officer, air force officer, math-science teacher, and pharmacist, constituted the Intellectual type. The Artistic type included artist, musician (performer), music teacher, advertising man, and author-journalist. The Social type included personnel director, public administrator, rehabilitation counselor, Y.M.C.A. secretary, social worker, social science teacher, and minister from Group V of the

SVIB, mortician from Group VIII, and librarian from Group VI. The Enterprising type included production manager, school superintendent, sales manager, real estate salesman, life insurance salesman, lawyer, and president-manufacturing. CPA owner forming Group VII of the SVIB, and senior CPA, accountant, office worker, purchasing agent, banker, and pharmacist from Group VIII represented Holland's Conventional type. The supplementary occupational scales on the SVIB were not used in this study because there is still some question as to where they will eventually be placed in terms of the present occupational groups.

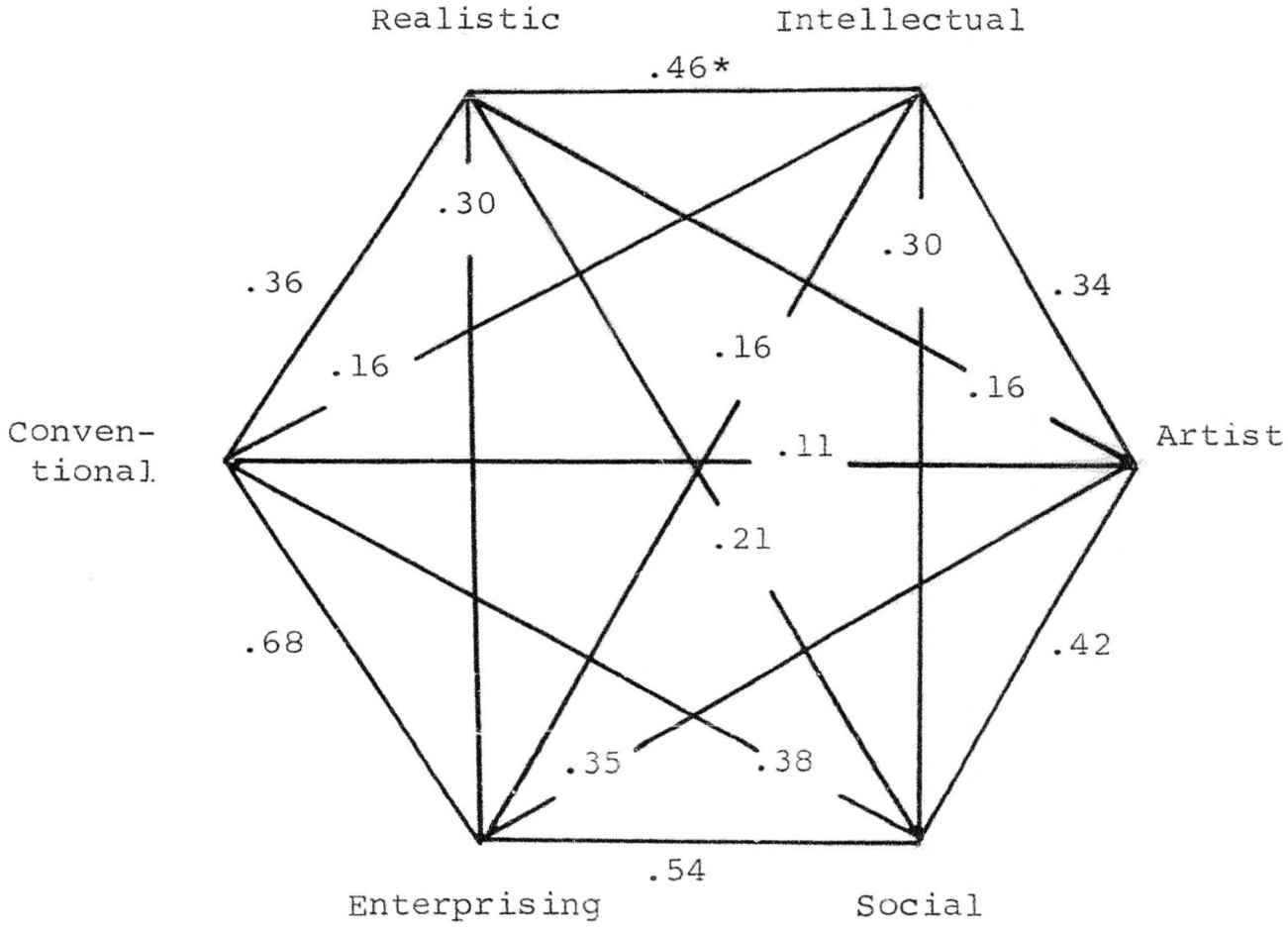
Primary and secondary occupational areas were determined following the method proposed by Kristjanson (1969). Kristjanson argued that the pattern analyses advocated by Darley and Hagenah (1955), by Stephenson (1961), and by Korn and Parker (1962) are all highly subjective, meeting with little inter-judge concurrence. In an attempt to remedy this, Kristjanson simply found the mean standard score for each of Holland's categories on the SVIB.

Empirically speaking, the method met with relatively good success, although Kristjanson found that it was sometimes difficult to clearly distinguish between "primary" and "reject" areas.

Since this study was not concerned with reject patterns, but with primary and secondary patterns, it was felt that such a limitation could be overlooked. That is, there was no call for a wide margin of difference between the primary and secondary areas in this study as there was between primary and reject patterns in Kristjanson's study.

Thus, standard scores from each individual's SVIB profile were punched on cards and relocated so that they fell into the appropriate category according to Holland's theory. The mean for each category was then compiled for each individual. Consistent and inconsistent vocational patterns were simply determined by scanning the print out and establishing, according to the "hexagonal model" of Holland et al. (1969, p. 4) whether they represented consistent or inconsistent vocational combinations. A reproduction of this model is shown in Figure 1. Since Holland et al. (1969, p. 16) have already established that the shortest distance between points on the hexagon represent the highest degree of similarity between vocational types, adjacent categories were considered consistent patterns in keeping with Holland's (1966b, p. 44) earlier theoretical position that such a pattern would indicate considerable overlap in terms of the

Figure 1. A Reproduction of Holland's Hexagonal Model for Interpreting Inter- and Intra- Class Relationships



* Correlation coefficient

personality traits included in each category. The following primary-secondary combinations with Holland's code numbers represented consistent patterns: Realistic-Intellectual (12); Intellectual-Realistic (21); Realistic-Conventional (14); Conventional-Realistic (41); Intellectual-Artistic (26); Artistic-Intellectual (62); Social-Artistic (36); Artistic-Social (63); Conventional-Enterprising (45); Enterprising-Conventional (54); Social-Enterprising (35); Enterprising-Social (53).

Whenever primary and secondary patterns did not occupy adjacent positions on Holland's hexagon, they were classified inconsistent. Thus, the following primary-secondary combinations yielded inconsistent codes: Intellectual-Social (23); Social-Intellectual (32); Intellectual-Conventional (24); Conventional-Intellectual (42); Intellectual-Enterprising (25); Enterprising-Intellectual (52); Realistic-Artistic (16); Artistic-Realistic (61); Artistic-Conventional (64); Conventional-Artistic (46); Artistic-Enterprising (45); Enterprising-Artistic (54); Artistic-Realistic (41); Realistic-Artistic (14); Realistic-Social (13); Social-Realistic (31); Social-Conventional (34); Conventional-Social (43); Realistic-Enterprising (15); Enterprising-Realistic (51).

Research Design and Statistical Procedure

Hypotheses number 1 through number 3 were tested using a two way analysis of variance or 2 x 3 factorial design, while hypotheses number 4 to number 10 inclusive were tested using a three way analysis of variance or 2 x 2 x 2 factorial design (Winer, 1962).

In the two way analysis the independent variables were consistent and inconsistent vocational patterns, and high, medium, and low academic ability, while the dependent variable was I-E scores. To establish the three levels of academic ability, ACT composite scores for all subjects were divided at the 33rd and 67th percentiles. This meant that standard scores of 22 or lower represented low academic ability, standard scores from 23 through 25 medium academic ability and standard scores above 26 high academic ability.

Of the total sample, 19 subjects were excluded because their records were incomplete. IBM cards for the remaining 474 subjects were then placed in the appropriate cell and an analysis of the data was carried out by the IBM 360-65 computer at the University of Manitoba Computer Center, using Chebib's (1968, p. 12) factorial analysis of variance program with equal or unequal subclass numbers. A diagram of the design is shown in Figure 2.

Figure 2. Diagrammatic Representation of Experimental Design for Hypotheses 1 - 3

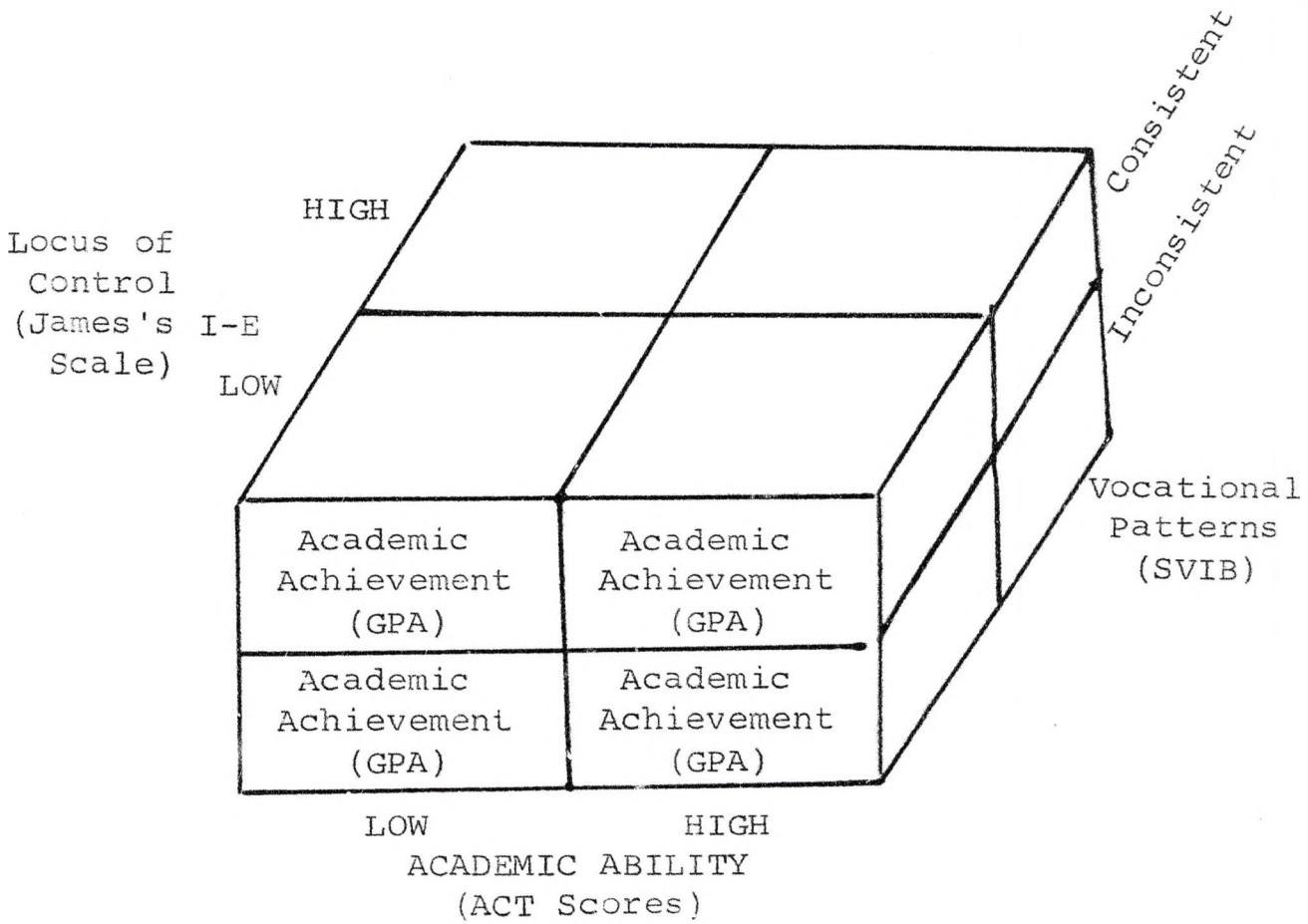
ACADEMIC ABILITY: ACT COMPOSITE SCORES

Vocational Patterns	LOW	MEDIUM	HIGH
CONSISTENT SVIB	James's I-E Scale Scores	James's I-E Scale Scores	James's I-E Scale Scores
INCONSISTENT SVIB	James's I-E Scale Scores	James's I-E Scale Scores	James's I-E Scale Scores

For the three way analysis of variance the independent variables became low and high I-E scores, low and high ACT scores, and consistent and inconsistent vocational patterns. The limits for each of the first two mentioned variables were established by eliminating scores between the 45th and 55th percentile. Thus, I-E scores of 39, 40, and 41, and ACT scores of 22, 23, and 24, were deleted. Internals therefore scored 38 or lower on James's Scale and externals 42 or higher, while low academic ability included ACT scores of 21 or lower and high academic ability 25 or higher.

This division meant that of the original 493 subjects, only 356 could be used. Accordingly, cards for these subjects were placed in the appropriate cell and Chebo's program once again used to compute the data. The design for this analysis has been represented diagrammatically in Figure 3.

Figure 3. Diagrammatic Representation of Experimental Design for Hypotheses 4 - 10



CHAPTER IV

RESULTS AND DISCUSSION

Results

The findings of this study are presented in the order of the ten null hypotheses stated in Chapter 1. Each hypothesis, followed by a summary statement of the outcome, is included in this section of the Chapter. The Chapter is concluded with a general discussion of the results including some theoretical, empirical, and practical considerations of the study. Table 1 shows the mean, standard deviations, and standard errors of measurement for the two way analysis of variance and has background relevance to the first three hypotheses.

> Hypothesis 1. There is no significant difference between consistent and inconsistent vocational patterns in terms of internal-external locus of control.

An inspection of Table 2 revealed that the null hypothesis was supported. That is, an F ratio of .04 is not significant at the .05 level and consequently no further analysis was required (McNemar, 1962, p. 285). Thus, it can be

said that individuals with consistent vocational patterns do not differ significantly from individuals with inconsistent patterns in terms of internal-external locus of control.

TABLE 1

MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS FOR TWO WAY ANALYSIS OF VARIANCE

Classification By Factors (Levels)		Locus of Control Scores			
		N	M	SD	SE
	Total	474	39.50	9.49	0.03
Vocational Patterns	Consistent (Con)	335	39.45	9.60	0.51
	Inconsistent (Inc)	139	39.61	9.24	0.80
Academic Ability	Low (LA)	149	41.38	9.26	0.77
	Medium (MA)	171	39.47	9.17	0.72
	High (HA)	154	37.71	9.76	0.76
	Con-LA	98	41.49	9.11	0.95
	Con-MA	119	39.34	9.04	0.86
	Con-HA	118	37.87	10.30	0.87
	Inc-LA	51	41.18	9.63	1.32
	Inc-MA	52	39.75	9.55	1.31
	Inc-HA	36	37.19	7.84	1.57

Hypothesis 2. There are no significant differences in terms of internal-external locus of control among individuals with low, medium, and high academic ability.

Inspection of Table 2 demonstrated that the null

TABLE 2

SUMMARY OF RESULTS FOR TWO WAY ANALYSIS OF VARIANCE FOR VOCATIONAL PATTERNS AND ACADEMIC ABILITY

Source of Variation	df	SS	MS	F
Vocational Patterns (VP)	1	3.8374	3.8374	0.04
Academic Ability (ACT)	2	1137.8701	568.9351	6.41*
VP x ACT	2	19.2606	9.6303	0.11
Within Groups	468	41539.4570	88.7595	
TOTAL	473	42580.9375		

* Significant at .01 level

hypothesis was rejected since an F ratio of 6.41 for the academic ability factor is signficant at the .01 level. A further analysis, using Scheffe's test for multiple comparisons (Edwards, 1960, p. 155), disclosed, more specifically, that a significant difference in terms of internal-external locus of control existed between individuals with high and low academic ability but not between high and medium or medium and low academic ability. Individuals with high academic ability, that is, scored signficantly lower on James's I-E Scale than individuals with low academic ability. Results

of the Scheffe's test are found in Table 3.

TABLE 3

SCHEFFE'S TEST ON MEANS FOR HIGH, MEDIUM, AND LOW ACADEMIC ABILITY

Comparisons	Difference	SE	Difference/SE
High - Medium	1.91	1.34	1.43
High - Low	3.67	1.34	2.74*
Medium - Low	1.76	1.34	1.31

* Significant at .05 level

Hypothesis 3. There is no significant interaction between consistent-inconsistent vocational patterns and academic ability in terms of internal-external locus of control.

An examination of Table 2 indicated that the null hypothesis was retained since an F ratio of .11 is not significant at the .05 level. This suggested that the various combinations of consistent and inconsistent patterns and academic ability were not related to significant differences among mean scores for internal-external locus of control.

Hypothesis 4. There is no significant difference in terms of academic achievement between individuals with low or high academic ability.

Inspection of Table 4 disclosed that the null hypothesis was rejected since an F ratio of 105.16 is significant at the .01 level. Furthermore, since only two comparisons

TABLE 4

SUMMARY OF RESULTS FOR THREE WAY ANALYSIS OF VARIANCE FOR VOCATIONAL PATTERNS, ACADEMIC ABILITY AND LOCUS OF CONTROL

Source of Variation	df	SS	MS	F
Vocational Patterns (VP)	1	1.4527	1.4527	2.88*
Academic Ability (ACT)	1	53.0884	53.0884	105.16***
Locus of Control (I-E)	1	2.5090	2.5090	4.97**
VP x ACT	1	0.4932	0.4932	0.98
VP x I-E	1	0.0035	0.0035	0.01
ACT x I-E	1	0.5054	0.5054	1.00
VP x ACT x I-E	1	0.5652	0.5652	1.12
Within Groups	348	175.6804	0.5048	
TOTAL	355	242.9807		

* Significant at .10 level
** Significant at .05 level
*** Significant at .01 level

were made, the F ratio served to reflect the direction of the difference between the two groups and, as can be seen

in Table 5, indicated that individuals with high academic ability performed appreciably better academically than students of low academic ability.

TABLE 5

MEANS, STANDARD DEVIATIONS, AND STANDARD ERRORS FOR THREE WAY ANALYSIS OF VARIANCE

Classification By Factors (Levels)		Academic Achievement			
		N	M	SD	SE
	Total	356	2.24	0.83	0.04
Vocational Patterns	Consistent (Con)	242	2.31	0.82	0.05
	Inconsistent (Inc)	114	2.09	0.83	0.07
Academic Ability	Low (LA)	164	1.79	0.69	0.06
	High (HA)	192	2.63	0.74	0.05
Locus of Control	Low (Is)	183	2.39	0.84	0.05
	High (Es)	173	2.09	0.78	0.05
	Con-LA-Is	38	1.90	0.80	0.12
	Con-LA-Es	65	1.75	0.64	0.09
	Con-HA-Is	80	2.76	0.65	0.08
	Con-HA-Es	59	2.59	0.71	0.09
	Inc-LA-Is	31	1.94	0.67	0.13
	Inc-LA-Es	30	1.60	0.64	0.13
	Inc-HA-Is	34	2.47	0.97	0.12
	Inc-Ha-Es	19	2.45	0.59	0.16

Hypothesis 5. There is no significant difference in academic achievement between individuals with low or high internal-external locus of control.

The null hypothesis was rejected since, as indicated in Table 4, an F ratio of 4.97 is significant at the .05 level. Further analysis of the data presented in Table 5 demonstrated that internally controlled individuals scored significantly higher academically than externals.

Hypothesis 6. There is no significant difference in terms of academic achievement between individuals with consistent or inconsistent vocational patterns.

The null hypothesis was confirmed. That is, as an inspection of Table 4 reveals, an F ratio of 2.88 is not significant at the .05 level. There was no difference in academic performance therefore between individuals with consistent or inconsistent vocational patterns.

Hypothesis 7. There is no significant interaction between consistent-inconsistent patterns and academic ability in terms of academic achievement.

The null hypothesis was supported since the F ratio of .98 for the two factors is not significant at the .05 level. Thus, it appeared that the various combinations of consistent and inconsistent vocational patterns and academic ability did not appreciably affect academic performance.

Hypothesis 8. There is no significant interaction between consistent-inconsistent patterns and internal-external locus of control in terms of academic achievement.

The null hypothesis was accepted. An inspection of Table 4 revealed that an F ratio of .01 associated with this interaction is not significant at the .05 level. In other words the two factors did not combine in a fashion which would signifcantly influence academic performance.

Hypothesis 9. There is no significant interaction between internal-external locus of control and academic ability in terms of academic achievement.

The null hypothesis was retained since the F ratio of 1.00 associated with the interaction of these factors is not significant. The combined effect therefore of internal-external locus of control and academic ability had no appreciable influence on academic performance.

Hypothesis 10. There is no significant interaction among consistent-inconsistent patterns, academic ability, and internal-external locus of control in terms of academic achievement.

The null hypothesis was supported. That is, as an inspection of Table 4 shows, an F ratio of 1.12 is not significant at the .05 level. Consequently, it was assumed that the various combinations of the three factors did not result in significant differences in academic performance.

Discussion

While the theoretical paradigms of Rotter (1954) and

of Holland (1966b) represent different areas of speculation and interest, they appeared to display enough similarity to warrant further investigation. The ten null hypotheses formulated in the present study were tested to disclose the nature of the relationship between Rotter's (1966) constructs of internal-external locus of control and Holland's (1966b) constructs of consistent and inconsistent vocational patterns.

Of the ten null hypotheses tested the first three dealt with the interdependence of consistent-inconsistent vocational patterns, academic ability, and internal-external locus of control, the latter representing the dependent variable in a two way analysis of variance.

The results indicated that while there was a slight difference between individuals with consistent and inconsistent vocational patterns in terms of I-E, the former showing a lower degree of externality (see Table 3), the difference was not statistically significant. Similarly, the interaction between consistent-inconsistent patterns and academic ability, as measured by the ACT, yielded no significant difference in terms of I-E. Stated another way, the results gave no empirical evidence that supported the assumed theoretical similarities between Rotter's externally

controlled individual and Holland's vocationally inconsistent individual, or between internally controlled individuals and vocationally consistent individuals.

On the other hand, the rejection of the second null hypothesis indicated that academic ability differentiated statistically between high ability students and low ability students in terms of I-E. High ability students displayed less externality, or were more internally controlled than low ability students. This difference held true however between extreme groups only; individuals with medium academic ability were not significantly different from either high or low ability individuals.

These findings were consistent with previous studies reported by James (1965) who indicated that internals do better scholastically than externals. Since the ACT was developed to predict success at college it could be argued that internals do better at college because they apparently have more ability to begin with than externals. Regardless of whether the ACT is viewed as an achievement or an aptitude test those who score higher on it can be expected to do better at college.

The remaining seven hypotheses were tested by a three way analysis of variance to determine the relationship

among consistent and inconsistent vocational patterns, academic ability, and internal-external locus of control in terms of academic performance or grade point average which represented the dependent variable in the analysis.

The rejection of hypotheses 4 and 5 indicated that internally controlled students and those with high academic ability faired better scholastically than externals and individuals with low ability. These results tended to support earlier studies. James (1965) has already suggested that internals perform better academically than externals and certainly the relatively high validity of the ACT cited earlier in this study would lead one to conclude that individuals scoring high on the test would also do well academically.

While hypotheses number 1 was not rejected at the .05 level of significance, it was significant at the .10 level suggesting a tendency for individuals with consistent vocational patterns to perform better scholastically than individuals with inconsistent patterns. This evidence is in keeping with Holland's (1966b) position and gives at least some credence to the possibility that inconsistent vocational patterns might be somewhat indicative of other problem areas such as under-achievement.

Since none of the interaction effects was statistically significant, it was impossible to infer any relationship between internal-external locus of control and consistent-inconsistent vocational patterns in terms of academic achievement. Nevertheless, in the case of the three factor interaction, it was interesting to note that the highest mean grade point average was obtained by individuals with consistent vocational patterns, high academic ability, and low externality, while the lowest mean grade point average was obtained by students with inconsistent patterns, low academic ability and high externality. However, in the absence of statistical significance these results serve only as a point of interest.

Theoretical Considerations

The results of this study did little to alleviate the seeming confusion which surrounds the relationship between theories of vocational choice or interest and theories of personality. Certainly the optimism shared by Bohn (1966), Irvin (1968), and Goldschmid (1967) all of whom resolved in one way or another that personality characteristics and vocational choice or interest are closely related, could not be generated from the present findings.

In a less general way, but of no less importance to the present study, the results did not corroborate the assumed relationship between Rotter's (1954) and Holland's (1966b) theory in terms of the constructs examined. Naturally this does not mean that the theories could not be related in other ways. What it did seem to mean however, was that despite the apparent theoretical proximity of the constructs they are, if not mutually exclusive, far enough apart empirically to be considered as at least quite different. Thus, contrary to the expectations, individuals with inconsistent vocational patterns were no more externally controlled than individuals with consistent vocational patterns. Phrased another way, and Holland's claim notwithstanding, there was no reason to accept that inconsistent individuals would succumb to external pressure more so than consistent individuals. Furthermore, vocational inconsistency did not appear to result because an individual was externally controlled and hence more likely to be confused or influenced by forces "outside" himself, rendering him, in a sense, less able to make vocational choices on the basis of his own needs.

In light of Holland's (1966b, p. 3) position that "vocational interests are simply another aspect of

personality," the results of the present study were difficult to explain, especially since the constructs under examination display so much similarity at a theoretical level.

One explanation is that the constructs cannot be taken out of context, or viewed simultaneously in a way reminiscent of mixing metaphors. Therefore consistent and inconsistent vocational patterns should not be used to say anything about the individual outside the realm of occupational choice or interest. Similarily, Rotter's constructs of internal-external locus of control should not be permitted to intrude into this realm. Such an explanation is clearly fatuous, particularly, in the latter instance. A generalized belief system or way of perceiving events in one's life cannot be excluded from vocational choice or interest and still have relevance to human behavior.

Another possible explanation for the results may rest in part on the criticism Carkhuff, Alexik, and Anderson (1967) have levelled at Holland's theory. These authors maintained that Holland "has generalized from accumulated raw data and simple facts to the level of laws, which, while they serve to integrate a good deal of existing research and suggest testable hypotheses, do not provide explanations for specified consequences of the interaction of data and

laws." In essence, this, and other statements by the authors, simply mean that Holland's research is circular--it is used to change hypotheses which can once again be tested, but it does not modify his theory because it does "not flow deductively" from it in the first place. In addition, the authors have also argued that Holland's concepts and measurements, namely his Vocational Preference Inventory, being "almost one and the same," have also contributed to this circularity.

In terms of the present study the argument by Carkhuff, Alexik, and Anderson is well taken. The revised occupational classification system of Holland et al. (1969), which was used to determine consistent-inconsistent patterns, was not deductively arrived at from his theory but was, rather, developed directly from an extensive empirical study which examined the "relatedness" of the occupational scales on his Vocational Preference Inventory. This in itself is not an unacceptable procedure. However, it does not appear that Holland has since moved inductively from this point to his theory and made whatever changes were necessary according to his new classification. The question left begging is this: Does this new classification make any difference in terms of the concepts of consistent and

inconsistent vocational patterns?

However, the weaknesses inherent in Holland's theory are not unique, according to Carkhuff, Alexik, and Anderson (1967). In their words, "There does not appear to be any theory of vocational choice that meets the inductive-deductive model of theory building." If this is the case, then the same sort of problem should have arisen in prior studies of this nature. Since this kind of evidence was not forthcoming from the review of the literature it would be unjustifiable to conclude that the failure of this study to demonstrate a relationship between Rotter's and Holland's theories rested with some inadequacy in Holland's theory. Indeed, it seemed more logical to suspect that if there were in fact similarities in the concepts which went undisclosed in this investigation they did so because of an artifact in the study and not because of theoretical weaknesses. Further speculation along these lines is included in the next section on empirical considerations.

Empirical Considerations

Some of the empirical implications of this study have been mentioned earlier in this Chapter. Mention was given to the fact that internals, in agreement with prior studies

(James, 1965), fair better scholastically than externals, and that individuals with high academic ability show greater internality than those with low academic abilities. Likewise, some discussion has already been focused on the possible relationship between consistent vocational patterns and superior academic performance compared with individuals with inconsistent patterns.

What has been neglected so far is an attempt to explain at an empirical level why, in light of the perceived similarity between the constructs examined, no empirical relationship was established.

One possible answer to this question centered again on the new "empirically derived" scheme for occupational classification of Holland et al. (1969). Under his old system Holland (1966b, p. 44) postulated the existence of consistent and inconsistent vocational patterns partly on the basis of the theoretical resemblance among his six vocational types, and partly on empirical evidence gleaned from the occupational inter-relationships demonstrated on his Vocational Preference Inventory. The new system, on the other hand, is based entirely on empirical evidence, and while it closely parallels his former system, it did have an effect on the present study. For example, whereas combination of

the Enterprising-Artistic types and Social-Conventional types would be considered consistent patterns under the old system, they were considered inconsistent in the present study. However, judging from the reported correlations between these types (Holland et al., 1969, p. 4) which were relatively high in respect to adjacent categories, the possibility arose in retrospect that their inclusion in the inconsistent patterns could have biased this area somewhat by introducing a stability factor into the otherwise unstable group. Succinctly put, Enterprising-Artistic and Social-Conventional types may resemble consistent patterns more so than inconsistent patterns!

In addition to this, the new system expanded the number of occupational scales on the SVIB which fell into the Intellectual category. While Holland (1966b, p. 45) has proposed that stability is generally a function of consistency between primary and secondary areas he has also stated that certain types, namely the Intellectual and the Realistic, are more stable than the remaining four. This being the case, the predominance of Intellectual types found in the inconsistent category could have decreased the difference between this category and consistent patterns or made the difference more imagined than real.

Considering both these possible sources of contamination the net result could have been such as to nullify or reduce the difference between the two categories in terms of their susceptibility to external forces and therefore the internal-external locus of control would not differentiate between the two.

This line of reasoning fails to explain the fact that consistent and inconsistent patterns differed slightly in terms of academic performance. It seemed somewhat unusual that while inconsistent patterns were no more affected by external forces than consistent patterns, they nevertheless did less well academically. Therefore it could only be assumed that establishing "purer" categories according to the above discussion would enhance the difference between consistent and inconsistent patterns in terms of academic performance with the possibility existing that a higher level of statistical significance would be obtained.

In summary, the results of the present study did little to remove the confusion surrounding the relationship between personality and vocational choice or interest and supported the research of Cottle (1949), Thomas (1958), Blum (1947), and others, all of whom found little or no relationship between the areas. The results also brought

into question the assumptions of Seiss and Jackson (1967) and of Thorndike, Weiss, and Dawis (1967) who proposed that inadequate statistical measures were primarily responsible for the inability of researchers to establish such a relationship.

Practical Considerations

In a practical sense practitioners could make few inferences on the basis of the outcome of the present study. While the ACT and James's I-E Scale proved to be valuable instruments in predicting college success, the SVIB adjusted to Holland's system of consistent and inconsistent patterns met with only modest success in such instances, and consequently these patterns could only be used with extreme circumspection in predicting success.

Any attempt on the other hand to extrapolate from the I-E Scale to the adjusted SVIB or vice versa was found to be unjustifiable in terms of the present research. Neither internality nor externality on the I-E Scale was related to consistent or inconsistent patterns.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter is organized in the following manner: first, a summary of the study is presented; second, the conclusions are reported; and third, recommendations for further research are stated.

Summary

In a general way the purpose of this study was to explore more fully the relationship between theories of vocational choice and personality to determine whether the existing chasm between these two fields of study could be bridged. Toward this end two theories, Rotter's (1954) social learning theory and Holland's (1966b) theory of vocational choice, were selected for the investigation because they appeared to offer an unusually high degree of similarity, particularly in terms of the former theorist's (1966) constructs of internal and external locus of control and the latter's constructs of consistent and inconsistent vocational patterns.

Briefly stated internal-external locus of control refers to the degree to which an individual believes or expects that reinforcement is contingent upon his own behavior. Externally controlled persons see such reinforcement as outside of themselves or dependent upon "chance," "fate," "luck" etc. while internally controlled individuals expect reinforcement as a consequence of their own actions, independent, for the most part, of external forces.

Holland's theory embraces the assumption that six vocational types, Realistic, Intellectual, Social, Conventional, Enterprising, and Artistic, and six corresponding work environments, provide a sound model for explaining vocational choice. Very superficially, his theory allows that vocational choice involves the gravitation of each personality type to an appropriate work environment, one which will reinforce, in a sense, the expectations of the individual. In addition, the theory is given greater depth inasmuch as each type can be combined with another in a two way or primary-secondary classification system. Thus, where there is concurrence between the primary and secondary type, the code or pattern is said to be consistent, meaning that these types overlap considerably in terms of the theoretical characteristics of each. Conversely, inconsistent patterns emerge where there

is conflict between the primary-secondary combination.

Furthermore, the degree of consistency between the primary and secondary type offers an index of emotional stability, consistent patterns making for effective functioning. Vocationally consistent individuals according to Holland (1966b, p. 47), would enjoy greater success in nearly all their endeavors than would vocationally inconsistent persons, and in addition, be less influenced by external pressures. Since other research (James, 1965) has demonstrated the positive relationship between internality and educational success and externality and conforming behavior (Green, Lotsoff, and James, 1964), the similarity, at face value, between internals and vocationally consistent individuals and between externals and vocationally inconsistent individuals was striking. Consequently, the present research focused first on the relationship between consistent and inconsistent patterns and internal-external locus of control and secondly, on the relationship between these variables and academic success.

The sample consisted of 493 freshmen males who had enrolled at the University of North Dakota during the Summer or Fall of 1967. Each student had received the Strong Vocational Interest Blank, American College Tests, and

James's Scale of Internal-External Locus of Control as part of the University of North Dakota orientation program.

Scores for James's Scale and ACT represented the degree of externality and academic ability respectively. The occupational scales on the SVIB were grouped into the six vocational types according to the most recent empirical evidence of Holland et al. (1969) and the mean standard score for each type was then computed at the University of North Dakota Computer Center. A print out of this data was then scanned to determine the primary and secondary patterns, the highest mean score representing the former category and the second highest mean score the latter. Consistent and inconsistent patterns were then determined using the "hexagonal model" of Holland et al. (1969), where adjacent points represented consistent codes and all other combinations inconsistent codes.

To establish the relationship between I-E and inconsistent-consistent patterns a two way analysis of variance was used. Low, medium, and high academic ability and consistent and inconsistent patterns constituted the independent variable.

The interdependence among I-E, academic ability, and consistent-inconsistent patterns, and academic performance

was then computed using a three way analysis of variance. The dependent variable, academic performance in this case, was simply the individuals cumulative grade point average at the end of the Fall semester. Both analyses were run at the University of Manitoba Computer Center.

The results of the study, presented according to the ten hypotheses, were as follows:

1. No significant difference was found between consistent and inconsistent patterns in terms of internal-external locus of control.
2. A significant difference was found between high and low ability students in terms of internal-external locus of control. High ability students displayed significantly less externality--were more internally controlled--than low ability students. No differences were found however, between medium ability students and either low or high ability students.
3. No significant interaction was found between consistent-inconsistent patterns and academic ability in terms of internal-external locus of control.
4. A significant difference was found between high

and low ability students in terms of academic achievement. High ability students obtained higher grade point averages than low ability students.

5. A significant difference was found between internals and externals in terms of academic achievement. Internals obtained higher grade point averages than externals.
6. No significant difference was found between students with consistent and inconsistent vocational patterns in terms of academic achievement. A trend however, favoring consistent patterns was found.
7. No significant interaction was found between consistent-inconsistent patterns and academic ability in terms of academic achievement.
8. No significant interaction was found between consistent-inconsistent patterns and internal-external locus of control in terms of academic achievement.
9. No significant interaction was found between internal-external locus of control and academic ability in terms of academic achievement.

10. No significant interaction was found among consistent-inconsistent patterns, academic ability, and internal-external locus of control in terms of academic achievement.

Conclusions

Generally the study did little to bridge the gap which seems to exist between theories of vocational choice or interest and personality. No relationship between Rotter's constructs of internal-external locus of control and Holland's constructs of consistent and inconsistent patterns were found. It was concluded therefore, that despite superficial similarities between the constructs, especially at a theoretical level, they should not be confused. It was also concluded that the SVIB, adapted to Holland's theory, and James's I-E Scale could not be used to shed greater light on one another in a clinical sense. In other words, no inferences could be made about the SVIB using James's I-E Scale.

At the same time however, it was concluded that high ability students are usually more internally controlled than low ability students which may help to explain why internals have characteristically performed better academically

than externals. Furthermore it was concluded that the ACT, and James's I-E Scale were valuable instruments for predicting academic success since consistent students faired only slightly better academically than inconsistent students.

Recommendations for Further Research

1. Replicate the present study using Holland's (1966b) original classification system for consistent and inconsistent vocational patterns.
2. Determine the relationship between Holland's six vocational types and internal-external locus of control to establish whether the Intellectual and Realistic types in particular might introduce an element of stability into an otherwise inconsistent pattern.
3. Replicate the study using Holland's Vocational Preference Inventory instead of the SVIB to determine whether the former provides differences in terms of consistent and inconsistent patterns and internal-external locus of control.
4. Replicate the present study using a larger sample which would permit greater distinction

between the variables and, in addition, allow for a more thorough examination of mid-range I-E scores.

5. Replicate the present study using Holland's (1966b) original divisions of the SVIB into vocational types to establish whether his initial presentation of these were more closely allied to his theory than those he presented at a later date (Holland et al., 1969).

Naturally such recommendations have been presented with the hope that further investigations will cast greater light on the relationship between the theories of Rotter and of Holland and ultimately contribute to a greater understanding of personality and of vocational choice theory. For, as Watts (1967, p. 55) has stated it; "Problems that remain persistently insoluble should always be suspected as questions asked in the wrong way."

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