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LOCUS OF CONTROL AS AN ORGANIZING CONSTRUCT
FOR VOCATIONAL INDECISION AND VOCATIONAL
DIFFERENTIATION.

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LOCUS OF CONTROL AS AN ORGANIZING CONSTRUCT
FOR VOCATIONAL INDECISION AND
VOCATIONAL DIFFERENTIATION

DISSERTATION

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the Degree Doctor of Philosophy in the Graduate
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By

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* * * * *

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ii
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## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACKNOWLEDGEMENTS</td>
<td>ii</td>
</tr>
<tr>
<td></td>
<td>VITA</td>
<td>iii</td>
</tr>
<tr>
<td></td>
<td>LIST OF TABLES</td>
<td>vi</td>
</tr>
<tr>
<td></td>
<td>LIST OF FIGURES</td>
<td>vii</td>
</tr>
<tr>
<td>I</td>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Social Learning Theory</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Vocational Indecision</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Vocational Differentiation</td>
<td>9</td>
</tr>
<tr>
<td>II</td>
<td>REVIEW OF THE LITERATURE</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Locus of Control</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Vocational Indecision</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Vocational Differentiation</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Summary</td>
<td>31</td>
</tr>
<tr>
<td>III</td>
<td>METHODOLOGY</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Subjects</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Instruments</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Setting and Procedure</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Independent and Dependent Variables</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Hypotheses</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Data Analysis</td>
<td>40</td>
</tr>
<tr>
<td>IV</td>
<td>RESULTS</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Vocational Indecision</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Vocational Differentiation</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Relationships Among the Dependent Variables</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Summary</td>
<td>49</td>
</tr>
</tbody>
</table>
V. DISCUSSION AND CONCLUSIONS ........................................... 50

   Relationships Between Data and
   Experimental Hypotheses ........................................... 50
   Limitations and Implications ..................................... 60
   Conclusions .......................................................... 62

BIBLIOGRAPHY ..................................................................... 63
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Analysis of Variance of Vocational Indecision Scores</td>
<td>42</td>
</tr>
<tr>
<td>2.</td>
<td>Analysis of Variance of Need for Structure Factor Scores</td>
<td>43</td>
</tr>
<tr>
<td>3.</td>
<td>Analysis of Variance of Multipotentiality Factor Scores</td>
<td>43</td>
</tr>
<tr>
<td>4.</td>
<td>Analysis of Variance of Block Factor Scores</td>
<td>44</td>
</tr>
<tr>
<td>5.</td>
<td>Analysis of Variance of Delay Factor Scores</td>
<td>45</td>
</tr>
<tr>
<td>6.</td>
<td>Analysis of Variance of Traditional Vocational Differentiation Scores</td>
<td>46</td>
</tr>
<tr>
<td>7.</td>
<td>Analysis of Variance of Revised Vocational Differentiation Scores</td>
<td>46</td>
</tr>
<tr>
<td>8.</td>
<td>Relationships Among Vocational Indecision Total and Factor Scores and Two Measures of Vocational Differentiation</td>
<td>48</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Details</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Eysenck's Hierarchical Model</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>Holland's Hexagonal Model</td>
<td>11</td>
</tr>
<tr>
<td>3.</td>
<td>Mean VPI Profiles: Internal and External Groups</td>
<td>53</td>
</tr>
<tr>
<td>4.</td>
<td>Mean VPI Profiles: Male and Female Groups</td>
<td>59</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION

Although psychology is a relatively young discipline, those involved in its research and practice are already faced with a wide range of empirical facts, experimental hypotheses, behavioral descriptions, and field observations. In an effort to make sense of this wealth of information, psychologists have expended considerable time and energy in attempting to organize this knowledge. The resulting psychological models can then be tested and modified in a continuous exchange between data and concepts. This process would seem to have relevance for vocational psychology.

Recent critiques of vocational psychology and career counseling (Crites, 1974; Holland, 1974; Osipow, 1973) have reviewed the development of theories of vocational behavior, analyzed the research based upon these theories, and examined the techniques that have been used in career counseling. Limitations in the existing body of knowledge as well as directions to take in future research and development have also been noted. One of the major themes that seems to run throughout these critiques is the need for organization and synthesis of the existing data.
Several researchers (Bohn, 1966; Foster and Gade, 1973; Goldschmidt, 1967; Irvin, 1968) have suggested that personality characteristics have relevance for the study of vocational behavior. Osipow (1973) has indicated that the personality approach to career development is one of the four major types of career development theory. Thus, personality theory may provide a framework for organizing the data that has been collected from research in various areas of vocational psychology.

Eysenck (1947; 1970) has postulated a hierarchical model of personality (Figure 1). This system hypothesizes a supraordinate construct ("type") that is associated with a number of subordinate constructs ("traits"). The subordinate constructs are in turn related to a number of lower level constructs that are essentially behavioral in nature ("responses"). The hierarchical structure also implies that statistical relationships exist between the operational measurements of the various constructs. The model shown in Figure 1 displays part of the hypothesized structure of the "type" labeled "extraversion". Other structures would exist for other "types".

In addition to providing a framework for the organization of data in a hierarchical form, the model also allows the display of relationships between abstract and concrete constructs. Thus, a higher order personality construct could be shown to have a distinct relationship with a lower
Figure 1

Eysenck's Hierarchical Model
order (i.e. more concrete) construct. It has been noted that the concrete behaviors that make up the process of career development need to be integrated into any theory that hopes to explain vocational behavior (Osipow, 1969; 1973; Super, 1969). Eysenck's model provides a framework for doing this.

The purpose of this study was to investigate the relationships between a supraordinate construct from Rotter's social learning theory (locus of control) and two subordinate constructs from vocational psychology (vocational indecision and vocational differentiation).

Social Learning Theory

Osipow (1969) has noted that two important elements of vocational behavior are situational variables and the response capability of the individual. He goes on to say that "it is the situation and the response that determines selection and attainment, as well as effectiveness and adjustment, and response capability can be altered by counseling. Effort should be spent in developing ways to help individuals determine what can be controlled and how to do so" (Osipow, 1969, pg. 19).

The issue of situational variables and individual control has been addressed by Rotter and his colleagues (Rotter, 1954; Rotter, Chance, and Phares, 1972) in their development of a social learning theory of personality.
For Rotter, the unit of investigation for the study of personality is the interaction of the individual and his or her meaningful environment. The individual's behavior in the environment has a directional aspect; it may be said to be goal-directed. There are four basic concepts used in the prediction of behavior. One of these concepts, expectancy, is "the probability held by the individual that a particular reinforcement will occur as a function of a specific behavior on his part in a specific situation or situations" (Rotter et al., 1972, pg. 12.).

Rotter (1966) has speculated that expectancies generalize from a specific situation to a series of situations which are perceived as similar. Thus, individuals hold generalized expectancies about the relationship between their behavior and its environmental consequences (e.g. reinforcement). Rotter (1966) has further speculated that individuals fall into two general categories: those who believe environmental consequences are determined by external events (e.g. chance, fate) and those who believe environmental consequences are determined by internal events (e.g. skill, ability). Rotter (1966) has also developed the I-E Scale to measure an individual's belief in his or her internal versus external control of environmental consequences. Thus, the I-E Scale has been used to measure an individual's locus of control.
A number of studies have examined the variables which distinguish "internals" from "externals". All of these studies have use the I-E Scale, or some form of it, in categorizing individuals as having an internal or external locus of control.

Seeman and Evans (1962) found that internally oriented individuals were more likely to possess more information about their environment. Davis and Phares (1967) found that internally oriented individuals were more likely to engage in information-seeking behavior. Other studies have suggested that internally oriented persons are more likely to make attempts to change the environment (Gore and Rotter, 1963; Strickland, 1965) and are more likely to be successful in their interventions (Hersch and Scheibe, 1967).

Internals have also been found to spend more time in intellectual activities (Crandall, Katkovsky, and Crandall, 1965; Crandall, Katkovsky, and Preston, 1962) and to view themselves as enduring, achieving persons (Hersh and Scheibe, 1967). Foster and Gade (1973) found that internals obtain significantly higher grades than do externals in college and McGhee and Crandall (1968) found the same relationship for children.

When compared to externals, internals have been found to be less conforming (Crowne and Liverant, 1963), more dominant (Hersh and Scheibe, 1967), less dogmatic (Clouser and Hjelle, 1970), and less anxious (Butterfield, 1964).
Thus, locus of control seems to be a sufficiently broad personality characteristic to function as a "type" or supraordinate construct in Eysenck's hierarchical model.

Vocational Indecision

Chickering (1972) has delineated seven major vectors of human development. Each individual must master the tasks demanded by each vector in order to reach maximum adjustment with the environment.

Chickering's sixth vector involves the development of purpose. This includes establishing a personal life-style, selecting recreational interests, and clarifying vocational and educational goals. The individual must also formulate a plan to integrate his or her life-style, recreations, and vocation into a congruent whole.

The inability to resolve these tasks may lead to vocational indecision. This break in the developmental process seems to be fairly common. University counseling center personnel are faced daily with students having difficulty in making an educational or vocational choice. It is not surprising to find that a large amount of research in vocational psychology has examined the undecided student. Most of these studies have employed a contrasted groups design, comparing decided and undecided students on a wide range of intellectual, demographic, and personality variables.
In general, it seems that undecided students are characterized by lower levels of academic ability and achievement. Ashby, Wall, and Osipow (1966) found that students who were only tentatively decided about their educational and vocational plans scored lower on a variety of aptitude tests than did decided and totally undecided students. Lunneborg (1975) indicated that indecision is negatively correlated with ability using the sub-tests of the Washington Pre-College Test Battery as the criteria.

On the basis of their research, Holland and Nichols (1964) determined that undecided students could best be described as "oral dependents". Ashby et al. (1966) found that undecided students were more dependent as measured by the Bernreuter Personality Inventory. Harman (1973) also characterized the undecided student as being low in self-confidence and dependent upon the opinions of others.

Resnick, Fauble, and Osipow (1970), Maier and Herman (1974), and Marr (1965) all found that undecided students possess low levels of self-esteem. Armatas and Collister (1962) found that students who were indifferent to large numbers of interests and vocations also exhibited low needs for dominance, aggression, and deference as measured by the Edwards Personal Preference Schedule. Maier and Herman (1974) found that the undecided student is also more dogmatic than his decided counterpart.
Thus, the undecided student is characterized by a set of personality and intellectual variables that seems to coincide with the description of the externally oriented person described above. Vocational indecision was therefore selected as the first subordinate construct in this study.

**Vocational Differentiation**

Osipow (1973) has divided theories of vocational behavior into four general categories. These are trait-factor approaches, sociological theories, self-concept theories, and personality theories. Holland's career typology theory of vocational behavior is of the latter type. The current theory is the result of an early theoretical statement (Holland, 1959) and of changes dictated by subsequent research (Holland, 1962; 1966; 1973).

Holland has postulated six types of work environments (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional) and has delineated the elements that constitute them. He has also hypothesized that every individual has a developmental hierarchy resulting from the individual's adjustment to each of the six environments. If an individual's personality is dominated by one orientation, he or she can be expected to select a career in an environment matching that orientation.
Holland's theory has generated a large body of research, much of it supportive of his conceptualization of vocational behavior. Holland (1959) has developed the Vocational Preference Inventory (VPI) to measure the personal orientation of individuals. Although the instrument was originally developed as a personality measure to distinguish the six personality types, it has been widely used as a vocational interest inventory.

Holland (1962) found that persons representing different personal orientations as measured by the VPI also had different personality characteristics. They were also likely to choose careers congruent with their personal orientation. Self-ratings and assessments of personal competencies have also been shown to differentiate the six types (Holland, 1968). Persons choosing vocations congruent with their personal orientations are also more likely to remain in those careers (Cole, Whitney, and Holland, 1971).

On the basis of empirical evidence, Holland, Whitney, Cole, and Richards (1969) have developed a hexagonal model (Figure 2) for displaying the relationships amongst the six personal orientations. The model shows that orientations adjacent to one another have a number of characteristics in common, while those further apart are least alike. Several constructs in Holland's theory have been derived from this model.
Consistency indicates the degree to which an individual's second highest orientation is similar to his or her highest orientation. For example, someone with a hierarchy typified by Realistic and Conventional elements would have a highly consistent orientation while someone with Realistic and Social elements would not.

Congruence indicates the degree of similarity between an individual's primary orientation and his or her vocational choice. Someone choosing to work in a Realistic environment would be termed congruent if his or her primary orientation was also Realistic, but incongruent if it was Social.

Differentiation indicates the degree to which an individual clearly resembles one orientation and shows little resemblance to other orientations. A person who resembles many orientations would be labeled undifferentiated.

Given that Holland's theory is one based upon personality and that the six personal orientations have been found
to have distinct personality characteristics associated with them, it seems reasonable to assume that the three derived constructs (consistency, congruence, and differentiation) would also have some relationship to personality.

Research tends to support the notion that Holland's constructs are related to a variety of personality and intellectual variables. With respect to differentiation, Holland (1968) felt that highly differentiated persons would be less dependent upon the attitudes and opinions of others. Frantz and Walsh (1972) indicated that differentiated students tend to be more satisfied and to achieve more than students who are not. Lunneborg (1975) and Kazin (1977) have suggested that differentiation has the most relevance for defining indecision. Thus, vocational differentiation was chosen as the second subordinate construct in this study.

In summary, the purpose of this study was to investigate the relationship between a major personality construct (locus of control) and two subordinate constructs from vocational psychology (vocational indecision and vocational differentiation).
CHAPTER II
REVIEW OF THE LITERATURE

This study attempted to integrate constructs taken from three different areas of psychological research. The literature available on Holland's career theory alone totals well over 200 references. The research on Rotter's social learning theory reaches similar proportions. Thus, this review will exclude a large part of the available literature and will focus upon the research that is most relevant for this particular study.

Rather than attempt to summarize the research on an entire theory, this chapter will review the literature on the development and validity of the specific construct under consideration. Where appropriate, the construct will be tied to other constructs from the theory. This review will also give an elaboration of the research reported in Chapter I and which served as the basis for this study.

Some of the instruments used in this study are closely tied to the constructs being investigated. These instruments were widely used in the investigation of the constructs. This review will also provide information on the validity of the instruments.
Locus of Control

Lefcourt (1966) has defined internal and external locus of control by saying that "internal control refers to the perception of positive and/or negative events as being a consequence of one's own actions and thereby under personal control; external control refers to the perception of positive and/or negative events as being unrelated to one's own behavior in certain situations and therefore beyond personal control" (pg. 207).

The first attempt to measure this construct was made by Phares (1955). He developed a Likert-type scale with 13 items that measured the external and internal attitudes of individuals. A lengthy revision was formulated by James (1957). In subsequent revisions, the number of items was increased. Finally, in the most recent revision (Rotter, 1966; Rotter, Seeman, and Liverant, 1962), the number of items was decreased to the present 29 items.

The experiments conducted in each of these studies were similar and obtained similar results. The S's were given a series of tasks and, before each one, were asked to rate their probability of success on the task. Half of the S's were told that their performance depended upon skill and half were told that performance was largely a matter of chance. Half of the S's in each group were "internals" and half of the S's were "externals" as measured by the locus of control instrument being used.
As predicted, S's in the skill condition were more likely to lower their ratings of probability of success following a failure and raise their ratings of probability of success following a success than were S's in the chance condition. However, regardless of group assignment, internals were more likely to change their ratings in response to success or failure than were externals. The authors concluded that this was due to the fact that internals saw their performance more closely related to skill than did externals, regardless of environmental factors.

Validation studies have also been conducted with other forms of the internal-external scales. Cardi (1962) found a significant correlation between I-E scores and ratings of locus of control based upon clinical interviews. Adams-Weber (1963) found a significant association between I-E scores and type of consequences given by S's for the characters in a story completion test. Those S's providing more consequences that were due to external situations or agents also tended to score high (i.e. in the external direction) on the I-E scale used.

Attempts to Control the Environment. Since internally oriented individuals perceive themselves as having more control over their environments, they might be expected to be more likely to possess more information about their environment, to engage in information-seeking behavior, to make attempts to change the environment, and to be more
successful in their interventions. Research has generally supported these hypotheses.

Seeman and Evans (1962) used 43 matched pairs of male tuberculosis patients in their study. Measurements were taken on how much the patients knew about their own condition, how much they questioned doctors and nurses about their own condition, and how satisfied they were with the amount of feedback they were getting about their medical status. Based upon the independent ratings of doctors and nurses, the internally oriented patients knew more about their own condition, asked more questions of the doctors and nurses, and expressed less satisfaction with the amount of feedback they were getting from hospital personnel. Similar results were found by Seeman (1963) when he investigated reformatory inmates.

In a study by Davis and Phares (1967), 42 internal and 42 external male S's were randomly assigned to one of three experimental conditions: skill, chance, or ambiguity. They were all told that their task would be to influence the attitudes of another person concerning the war in Vietnam. The S's in the skill condition were told that success in an influence attempt depended upon the skill of the persuader. The S's in the chance condition were told that success depended mostly upon chance factors. The S's in the ambiguous condition were given neither skill nor chance instructions.
Before the influence attempt took place, all S's were given a chance to ask questions about the persons whose attitudes they were to change and to obtain more information about the war in Vietnam. Averaged over the three conditions, internals tended to ask significantly more questions. Although the results of the second analysis failed to reach significance, there was a trend for internals in the skill condition to request more information about the Vietnam war.

In a study of the participants in the civil rights movement of the sixties, both Gore and Rotter (1963) and Strickland (1965) found that internals were more likely to take part in marches and other protest activities. Straits and Sechrest (1963) and James, Woodruff, and Werner (1965) found that non-smokers were more likely to be internally oriented while smokers were more likely to be externally oriented. Furthermore, former smokers were more likely to be internally oriented than those who were still smoking. The authors concluded that this indicated that internally oriented people are more likely to attempt to take control of their environment than are externally oriented people.

Finally, Hersch and Scheibe (1967) found that volunteer student workers in a state hospital show a positive correlation between effectiveness as a mental health worker (as rated by supervisors and co-workers) and internality. This suggests that internally oriented people are more successful in changing the environment.
Achievement Motivation. It might be supposed that internally oriented persons would show more overt striving for achievement than those who felt they had little control over their environment. The research tends to support this supposition.

Crandall and his associates (Crandall et al., 1965; Crandall et al., 1962) have used the Intellectual Achievement Responsibility Questionnaire (IAR) to measure locus of control for children. They have found that those children accepting more responsibility for their achievement (i.e. are more internally oriented) spend more time in intellectual activities, demonstrated greater intensity of striving in intellectual pursuits, and score higher on mathematics and reading tests. This relationship was only found for male children.

Rotter and Mulry (1965) found that internally oriented S's invested more time in an angle-matching task than did externally oriented S's. Hersch and Scheibe (1967) found that internals are more likely to rate themselves as enduring and achieving on the Adjective Check List than are externals. Foster and Gade (1973) found that internals obtain significantly higher grades in college than do externals. McGhee and Crandall (1968) found the same relationship for children. As reported earlier, internals are also more likely to engage in information-seeking behavior, an activity that could be seen as a part of achievement motivation.
Personality Correlates. In the testing of major hypotheses, a number of studies have uncovered some personality correlates of locus of control. Most tend to be consistent with what has already been said about the differences between internals and externals.

It has been found that internals are less conforming (Crowne and Liverant, 1963), less anxious (Butterfield, 1964), less dogmatic (Cloouser and Hjelle, 1970), less hostile (Williams and Vantress, 1969), more dominant, sociable, and tolerant (Hersch and Scheibe, 1967), more insightful (Tolor and Reznikoff, 1967), and more trustful (Hamsher, Geller, and Rotter, 1968) when compared to externals.

Divergent Validity. Efforts have been made to insure that locus of control is a pure construct without the contamination of other factors. In particular, efforts have been directed towards eliminating the effects of social desirability in its measurement. Non-significant correlations between locus of control and social desirability have been reported by Rotter (1966), Tolor (1967), and Tolor and Jalowiec (1968). However, Altrocchi, Palmer, Hellman, and Davis (1968) have obtained a significant correlation between locus of control and social desirability using a sample of 111 male undergraduates. The correlation was not found for female undergraduates.

Hersch and Scheibe (1967) and Rotter (1966) have reported non-significant correlations between locus of control
and intelligence. Minton (1967) reported a non-significant correlation with political affiliation. Finally, Baron (1968) found no correlation between locus of control and authoritarianism. However, Rotter et al. (1962) did find that externally oriented individuals were significantly more authoritarian than internally oriented individuals.

**Vocational Indecision**

The research on vocational indecision has developed quite differently than the research on locus of control. Whereas locus of control is an integral construct in social learning theory, vocational indecision frequently gets only tangential treatment in theories of vocational behavior. Furthermore, vocational psychologists have been slow to produce an instrument to measure vocational indecision that is comparable to Rotter's I-E Scale. This may, in part, be due to the fact that indecision has been viewed as a state that could easily be assessed by asking an individual, "Have you decided upon a career". It is only recently that researchers have suggested that indecision is not a unitary construct and that its measurement may be more complex than was once assumed.

The literature reviewed below will examine the theoretical treatment of indecision, the attempts that have been made to measure indecision, and the intellectual and personality correlates of indecision.
Theoretical Treatment. Most vocational theories do not seem to deal with vocational indecision directly. However, several do deal with the tasks that must be accomplished in making a vocational choice. It might be hypothesized that the inability to make a vocational choice is due to the inability to master one or more of these tasks.

Tiedeman and O'Hara (1963) have delineated seven distinct stages which theoretically are experienced in the process of career development. The stages are exploration, crystallization, choice, clarification, induction, reformation, and integration. Each of these stages has been more fully described, but it does not seem that they provide any practical implications for counseling or for the development of instrumentation (Jepsen and Dilley, 1974).

Super (1963) has hypothesized five vocational developmental tasks that span the life of the individual. Two of these (crystallization and specification) are probably most relevant for the study of indecision. Super (1963) does present some moderately specific guidelines for counseling the individual having difficulties in his or her vocational development. However, the theory is more concerned with the development of the individual self-concept and instrumentation is likely to address the measurement of this construct rather than vocational indecision per se.

It has long been theorized that vocational indecision is composed of several components or that there are several
types of vocational indecision. Williamson (1939) divided indecision into four categories: no choice, uncertain choice, unwise choice, and discrepancy. Not satisfied with these categories, Bordin (1946) devised a different set: dependence, lack of information, self conflict, choice anxiety, and no real problem. Crites (1969) devised still another system with eight sub-categories. However, all of these formulations have remained in the theoretical realm with little empirical support.

Instrumentation. Appel, Haak, and Wittzke (1970) have produced one of the first pieces of empirical evidence to show that indecision is a multi-faceted construct. In their analysis of data from a variety of sources, they have found six factors which describe the undecided student: situation specific choice anxiety, data seeking orientation, concern with self-identity, generalized indecision, multiplicity of interest, and humanitarian orientation.

Although there have been attempts to develop a test to measure vocational indecision (Harren, 1966; Holland and Nichols, 1964), few have both taken into account the multi-dimensional nature of indecision and have persisted in the refinement of the instrument. The Career Decision Questionnaire (Osipow, Carney, Winer, Yanico, and Koschir, 1976) has begun to remedy this situation.

The Career Decision Questionnaire (more fully described in Chapter III) was designed to account for the multiple
dimensions that seem to make up the indecision construct. Two studies which factor analyzed the questionnaire (Kazin, 1976; Osipow, Carney, and Barak, 1976) obtained four similar factors. Kazin (1977) has named them: need for structure, multipotentiality, block, and delay. These factors reasonably seem to be elements of indecision and compare favorably with those found by Appel et al. (1970) and theorized by others (Williamson, 1939; Bordin, 1946; Crites, 1969).

Osipow et al. (1976) administered the test to seven groups of students from the Ohio State University. Average scores for groups with vocational concerns (e.g. those requesting vocational counseling or taking a course in vocational exploration) were generally higher than the average scores for groups without stated vocational concerns (e.g. those taking a course in introductory psychology). Furthermore, students in a course in vocational exploration showed a significant drop in their indecision scores following the completion of the course. Students experiencing no planned vocational intervention showed no significant change in their scores. Thus, the instrument appears to be a valid measure of vocational indecision.

Correlates of Indecision. Lunneborg (1975) has noted that the attempt to uncover correlates and antecedents of indecision has resulted in a confusing and contradictory picture. Lunneborg (1975) used 1622 college juniors in her study. All S's had taken the Washington Pre-College Test
Battery. This included fifteen achievement tests and the Vocational Interest Inventory. High school grade point averages for a variety of subject areas as well as overall grade point averages were available for each S. The S's also indicated their academic major. Those who had not selected a major were allowed to indicate that they were undecided.

Correlations were obtained between decision status and the information from the test battery. Although a number of significant correlations were found, most of them were weak (ranging from -.19 to .09) and seemed to be due to the large sample size. However, large correlations were found to exist between being undecided and having lower grades and fewer college credits. In a stepwise multiple regression, college grade point average and number of college credits were the two most powerful predictors of indecision. When these two factors were removed from the analysis, high school grade point average in mathematics and scores on the English usage achievement test became the most powerful predictors.

Ashby et al. (1966) divided 228 freshmen men and women into three groups according to the definiteness of their vocational and educational plans. Twenty-nine S's were undecided, 91 were tentative, and 108 were decided. The S's were given the Strong Vocational Interest Blank, the Bernreuter Personality Inventory, a variety of ability tests,
and were asked to rate themselves on six personality dimensions. Statistical analyses attempted to delineate the differences amongst the three groups.

There were no significant differences between the decided and undecided groups on the ability variables. Both of these groups scored significantly higher than the tentatively decided group. The undecided group scored significantly higher than the other two groups on the Bernreuter dependency scale. This agrees with Holland and Nichols (1964) description of the undecided student as being "orally dependent".

Resnick et al. (1970) used 114 male and 102 female S's from an introductory psychology class in their study. The S's completed a biographical questionnaire (which included a questionnaire about certainty of vocational choice), the Tennessee Self Concept Scale (as a measure of self-esteem), and the Kuder Occupational Interest Survey. The S's were then divided into a high self-esteem group and a low self-esteem group. The high self-esteem group was found to be significantly more certain of career choice than was the low self-esteem group.

Maier and Herman (1974) gave 141 freshmen students the Rokeach Dogmatism Scale, the Tennessee Self Concept Scale, and an author-devised measure of vocational decidedness. The undecided students were significantly more dogmatic and possessed significantly less self-esteem than the decided
students. A similar relationship between decidedness and self-esteem was also found by Marr (1965).

Walsh and Lewis (1972) gave the Vocational Preference Inventory and the Omnibus Personality Inventory to 214 undergraduates. The S's who were undecided about a major scored significantly higher on the Impulse Expression scale of the Omnibus Personality Inventory than did any other group. Walsh, Spokane, and Mitchell (1976) found that undecided students scored lowest of all groups on the Maturity of Goals and Curricular Adjustment scales of the College Inventory of Academic Adjustment.

Not all studies in the area of vocational indecision have found differences between groups of decided and undecided students. Some studies, frequently using the same instruments and the same variables used in the studies reviewed above, have found no differences between the groups (Baird, 1967; 1969; Buck, 1970; Elton and Rose, 1971).

As can be seen, the correlates of vocational indecision are not as clearly defined as are the correlates of locus of control. However, when differences are found, the undecided student tends to be lower in academic ability and achievement, lower in self-esteem, more dependent, and more dogmatic than are decided students. This description is quite similar to the description given earlier for the externally oriented individual.
Vocational Differentiation

Vocational differentiation, like locus of control, is a construct that is closely tied to a theory. However, differentiation is not a central construct of Holland's theory of vocational behavior. In fact, it seems that less research has been done on this construct than on any other construct in Holland's theory. The literature cited below will briefly summarize the research establishing the validity of Holland's theory and of the Vocational Preference Inventory (VPI) and will review the sparse research on correlates of vocational differentiation.

Validation Research. Holland's theory states that an individual can be described as being most similar to one of six personality types. Environments can also be described as matching one of the same six types that are used for individuals. Holland also asserts that individuals tend to seek out environments that correspond to their own type. The VPI (Holland, 1958) was developed to assess the degree to which an individual resembles each of the six types.

Basic support for the validity of the six types comes from a series of studies carried out by Holland in the early sixties. Over 1000 male and female National Merit Scholarship Finalists were assessed on a number of dependent variables and were classified according to types in a variety of ways. The studies included longitudinal studies of vocational choice (Holland, 1962; 1963a) and the relationships
between the six types and vocational images (Holland, 1963c),
self-descriptions (Holland, 1963b), coping behaviors and
competencies (Holland, 1963d), and vocational daydreams
(Holland, 1963e).

In general, the findings indicated that Holland's six
types did differ in their relationships to vocational
choice, hobbies and extracurricular activities, self ratings
of traits and skills, educational goals, academic and non-
academic achievement, and identification with famous people.

Wall, Osipow, and Ashby (1967) had male college fresh-
men rank themselves on personality descriptions correspond­
ing to Holland's six types. They found that the types
differed in their group scores on the Strong Vocational
Interest Blank. Results from a related study (Osipow, Ashby,
and Wall, 1966) confirmed that students choose occupations
congruent with their personality types.

Validity of the VPI has been examined by correlating
its scales with various measures of personality, interests,
and values. Psychometric instruments that have been used
have included the Adjective Check List (Bohn, 1966; Alston,
Wakefield, Doughtie, and Bobele, 1976), the Edwards Personal
Preference Schedule (Navran and Kendall, 1971; Patterson,
Marron, and Patterson, 1971); the Allport-Vernon-Lindzey
Study of Values (Williams, 1972), the Sixteen Personality
Factor Questionnaire (Holland, 1958; 1960; Williams, 1972;
Ward, Cunningham, and Wakefield, 1976), the Kuder Preference
Record (Rezler, 1967), the Omnibus Personality Inventory (Elton and Rose, 1967), the California Psychological Inventory (Kelso, 1969; Scott and Sedlacek, 1975), and the Strong Vocational Interest Blank (Cockriel, 1972; Lee and Hedahl, 1973; Navran and Kendall, 1971). In general, these studies have found that the scales of the VPI are related in meaningful ways to the scales of other inventories.

Research on Differentiation. As noted earlier, there has not been a great deal of research using Holland's construct of differentiation. (In his earlier work, Holland referred to this construct as homogeneity.)

Holland (1968) selected a sample of 6289 male and 6143 female college freshmen. They were given the VPI, the Preconscious Activity Scale (as a measure of originality), the Rokeach Dogmatism Scale, and a biographical questionnaire (for information on competencies, life goals, attitudes, vocational and educational aspirations, vocational choice, and other background details). There was also a follow-up study in which the S's were re-tested anywhere from eight to 12 months later.

In general, the study verified the construct and predictive validity of the VPI. Additionally, the S's were placed in one of three groups depending upon their VPI profile: high, middle, or low differentiation. For each group, a frequency count was made of the hits and misses made by attempting to predict vocational choice from the
VPI. For men, a chi-square test indicated that increasing differentiation allowed increasing accuracy of predication. The relationship did not hold for women.

Frantz and Walsh (1972) gave the VPI to 126 male graduate students. They also obtained information on each student's grade point average and satisfaction with the graduate program. Correlations showed that differentiation was positively correlated with grade point average and with satisfaction.

An analysis of variance was performed to investigate the relationship between Holland's three constructs (congruency, consistency, and differentiation) and the dependent variables (grades and satisfaction). Differentiation was found to be a significant contributor to the total variance of grades. Higher levels of differentiation were associated with higher grades.

Lunneborg (1975) found that differentiation was not a significant contributor in predicting level of indecision. However, she concluded that this construct had the most potential for use in the analysis of indecision. Kazin (1977) found that differentiation was the most relevant of Holland's constructs in studying indecision.

Although the results are not conclusive, trends indicate that the highly differentiated person achieves at a higher level, is more satisfied with his or her educational choice, and is less likely to be vocationally undecided.
Summary

Research has been reviewed from three different areas of psychological study. Synthesis is made difficult by the fact that the studies have not always used comparable populations, instruments, statistical analyses, or theoretical orientations. Indeed, some have failed to use any theoretical orientation in organizing their research.

However, this review has attempted to show that some general trends can be discerned. There seems to exist an externally oriented person who is somewhat dependent, low in achievement, anxious, and unlikely to attempt to alter his or her environmental circumstances either by information seeking behavior or by action-oriented intervention. A similar type of person has also been described in the literature on vocational indecision. This person, too, is dependent, is low in achievement, suffers from choice anxiety, and is unlikely to engage in information-seeking behavior. Finally, this indecisive, poorly achieving person may also be one who has a poorly defined (undifferentiated) interest profile.

The purpose of this study was to further examine the relationships amongst locus of control, vocational indecision, and vocational differentiation.
CHAPTER III
METHODOLOGY

Subjects

Fifty-six male (mean age = 19.82) and 60 female (mean age = 20.00) undergraduate students participated in this study. All were enrolled in an introductory psychology course (Psychology 100) at the Ohio State University during the Spring Quarter of 1978. Although participation in psychological experiences was part of the course requirements, students were also free to write a paper in place of such participation. Any student who chose to participate in experiments was free to choose the experiments in which he or she participated.

Instruments

All of the S's completed the following three questionnaires in the following order: the Career Decision Questionnaire, the Rotter I-E Scale, and the Vocational Preference Inventory.

The Career Decision Questionnaire. This instrument was designed to measure vocational and educational indecision in college students (Osipow, Carney, Winer, Yanico, and Koschir, 32
The questionnaire consists of 18 statements to which the S was asked to agree or disagree on a four-point scale ranging from "exactly like me" to "not at all like me". Items 3 through 18 are antecedents of vocational and educational indecision. Each item was designed to be independent of the others. The sum of these 16 items was used in this study as an index of indecision.

Osipow, Carney, and Barak (1976) have investigated the reliability of the instrument using a student population from the Ohio State University. Test-retest correlations on each of the items ranged from .3^ to .82 over a two-week interval for 52 males and 63 females. Test-retest correlations for the total indecision score were .90 and .82 for two different samples.

Items 1 and 2 on the questionnaire were designed to indicate an individual's degree of vocational and educational decidedness. The correlation matrix produced by Osipow, Carney, and Barak (1976) indicated that these two items were negatively correlated with items 3 through 18. This inverse relationship between decidedness and indecision is as expected and provides further evidence for the validity of this instrument.

Osipow, Carney, and Barak (1976) and Kazin (1976) have factor analyzed the Career Decision Questionnaire. Both analyses yielded similar factors. These factors, as reported and named by Kazin (1977), are explained below.
The first factor (items 5, 7, 8, 10, 11, 13, 14, and 17) represents a lack of skill in making decisions. It includes lack of information about occupations as well as lack of information about oneself. This factor is referred to as Need for Structure. The second factor (items 4 and 15) represents difficulty in making a choice between two or more possible alternatives and is designated by the term Multipotentiality. The third factor (items 3 and 9) represents a block in the decision-making process, perhaps calling for a new decision to be made. This factor is called Block. The last factor (items 12, 16, and 18) indicates a temporary halt in an otherwise satisfactory decision-making process. This factor is termed Delay.

Thus, the Career Decision Questionnaire can yield five scores: a total indecision score and four factor scores. These five scores were calculated for each S in the present study. Factor scores were calculated by summing the responses to the items making up each factor.

The Rotter I-E Scale. The I-E Scale was developed by Rotter (1966) to measure internal versus external locus of control. The instrument consists of 29 paired statements, six of which are "filler" items and are not scored. The S's are instructed to select the statement in each pair which they believe the most strongly. Each pair of scored items contains an item indicating a belief in an internal locus of control and an item indicating a belief in an external locus.
of control. The score is the sum of the items selected which indicate a belief in an external locus of control.

Rotter (1966) has reported test-retest reliabilities of .60 for males (n = 30) and .83 for females (n = 30) over a one-month interval and of .49 for males (n = 63) and .61 for females (n = 54) over a two-month interval. In both cases, S's were introductory psychology students from the Ohio State University. Internal consistency correlations ranged from .65 to .79. The instrument shows good construct and discriminant validity as shown by the studies cited in Chapter II.

The Vocational Preference Inventory (VPI). The VPI was developed by Holland (1958) before he completed the formulation of his theory of vocational behavior. The instrument consists of a list of 160 occupations. For each occupation, the S is instructed to indicate whether he or she "likes" or "dislikes" the occupation. The S is to make no response to those occupations to which he or she is indifferent.

The instrument yields scores on 11 different scales. Six of these scales correspond to the personal orientations noted earlier. The remaining five scales (Self-Control, Masculinity, Status, Infrequency, and Acquiescence) are supplementary and were not used in this study. Although the VPI was developed as a measure of personality, it has been widely used as a vocational interest inventory. This is how the instrument was used in the present study.
Reliability data for the VPI has been produced over the past 20 years. Most recently, Holland (1975) reported Kuder-Richardson-20 internal reliabilities of from .83 to .89 for males (n = 6289) and from .76 to .88 for females (n = 6143). Test-retest reliabilities ranged from .74 to .98 for college seniors tested over a six-week interval and from .61 to .86 for college freshmen tested over a one-year interval. The research on the validity of the VPI has been reported in Chapter II.

Setting and Procedure

Students who wished to participate in the study signed up for an experiment in "Attitudes, Interests, and Beliefs of College Students". They were instructed to report to the Psychology Laboratory on the West Campus of the Ohio State University. The Psychology Laboratory is a complex of carpeted rooms designed for research with human subjects. The current study was carried out in a room provided with individual carrels for the testing of subjects.

The S's were tested in groups of approximately 15 students each. After all S's were seated, E passed out the questionnaires and read the following set of instructions:

You are being asked to fill out three different questionnaires. Each questionnaire has its own answer sheet. Please be sure to mark your responses on the appropriate answer sheet and not on the questionnaire itself. Complete the questionnaires in the order in which they were given to you. As you finish each questionnaire, please raise your hand and I will take it from you. When you have finished the last one,
you are free to leave. If you wish to have more information about the experiment after you have finished, please remain until everyone has finished the questionnaires and I will be glad to answer any questions that you may have.

The E then explained the procedure by which S's could obtain the results of their questionnaires and answered any questions that were raised. The S's filled out a brief background information form and then completed the three questionnaires.

Independent and Dependent Variables

There were two independent variables in this study. Locus of control, as measured by the I-E Scale, was used as the first independent variable. The distribution of subject scores was divided at approximately the median for both males and females. Those with scores of 12 or more were termed "external" and those with scores of 11 or less were termed "internal".

Theories of vocational behavior have been called to task for failing to adequately consider the career development of women in their formulations (Osipow, 1973). In particular, some have questioned whether or not Holland's theory is equally applicable to men and women (Holland, 1962; Rose and Elton, 1971). Furthermore, the findings on the correlates of locus of control are not equivalent for men and women (e.g. Altrocchi et al., 1968). Therefore, sex was used as the second independent variable.
There were three dependent variables. The first, vocational indecision, was obtained from the Career Decision Questionnaire by summing the scores on items 3 through 18 for each subject.

The second dependent variable was a measure of differentiation obtained from the VPI. To obtain this measure, a person's lowest VPI scale score is subtracted from the highest scale score (Holland, 1968; Lunneborg, 1975). Higher differentiation scores indicate a higher specificity of interests. This procedure was used to obtain a traditional measure of differentiation (Dif-T).

The third dependent variable, also a measure of vocational differentiation, was also obtained from the VPI using a method developed by Cole and her colleagues (Cole, 1973; Cole and Cole, 1970; Cole and Hanson, 1971; Cole et al., 1971). This method attempts, in part, to bring an added degree of precision to the constructs of Holland's theory.

Their research employed principle components analysis (Harman, 1960) to extract factors from the correlation matrix of the six scales of the VPI. Following this analysis, two factors were selected to serve as the axes of a two-dimensional grid. Cole and her colleagues also developed a transformation matrix that allows the six scale scores of the VPI to be resolved into a single vector. This vector can be plotted as a point on the grid. Cole et al. (1971) defined differentiation as the distance that a point falls
from the center of the grid. In the present study, this distance was taken as a revised measure of differentiation (Dif-R).

**Hypotheses**

The following hypotheses, based upon the research summarized in the literature review, were formulated for this study. The first three hypotheses examined the relationships between the dependent and independent variables.

**Hypothesis 1.** Vocational indecision will differ as a function of locus of control. High levels of indecision will be associated with an external locus of control.

**Hypothesis 2.** Traditional measures of differentiation will differ as a function of locus of control. High levels of differentiation will be associated with an internal locus of control.

**Hypothesis 3.** Revised measures of differentiation will differ as a function of locus of control. High levels of differentiation will be associated with an internal locus of control.

The next three hypotheses examined the relationships among the three dependent variables.

**Hypothesis 4.** There will be a positive relationship between traditional differentiation scores and revised differentiation scores.
Hypothesis 5. There will be an inverse relationship between traditional differentiation scores and vocational indecision scores.

Hypothesis 6. There will be an inverse relationship between revised differentiation scores and vocational indecision scores.

Data Analysis

Relationships between dependent and independent variables were tested with a two-factor (Locus of Control X Sex) univariate analysis of variance. Relationships among dependent variables were examined using Person product-moment correlation coefficients. The statistical significance of the resulting correlations will be determined. The levels of significance will provide the basis for accepting or rejecting the hypotheses.
CHAPTER IV

RESULTS

This chapter is divided into four sections. The first two sections will present the results of the analyses of variance performed to investigate the relationships between the dependent and independent variables. The third section will present the results of the correlational analyses performed to investigate the relationships among the dependent variables. The fourth section will present a summary of the results.

Vocational Indecision

The group of 56 male S's obtained a mean score of 11.25 on the I-E Scale. A median split created a group of 31 "internals" ($\bar{x} = 8.42$) and 25 "externals" ($\bar{x} = 14.76$). The group of 60 female S's obtained a mean score of 11.72 on the I-E Scale. A median split created a group of 30 "internals" ($\bar{x} = 8.70$) and 30 "externals" ($\bar{x} = 14.73$). In the analyses of variance, alpha was set at .05.

Table 1 reports the results of the analysis of variance of vocational indecision scores. Both locus of control and sex were significant contributors to the total variance of
the scores. An inspection of cell means indicates that externals ($\bar{x} = 29.109$, S.D. = 8.751) scored significantly higher on indecision than did internals ($\bar{x} = 25.951$, S.D. = 7.515). Also, males ($\bar{x} = 29.250$, S.D. = 8.271) scored significantly higher on indecision than did females ($\bar{x} = 25.767$, S.D. = 7.918).

Since locus of control was found to be a significant contributor to total variance for indecision scores, it was decided to perform analyses of the four factor scores derived from the Career Decision Questionnaire to test whether or not they were differentially related to locus of control. The results of those analyses are reported in Tables 2 through 5.

Table 2 indicates that both locus of control and sex were significant contributors to the total variance of the Need for Structure factor scores. An inspection of cell

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus</td>
<td>1</td>
<td>324.577</td>
<td>5.16</td>
<td>.025</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>351.456</td>
<td>5.59</td>
<td>.020</td>
</tr>
<tr>
<td>Locus X Sex</td>
<td>1</td>
<td>89.079</td>
<td>1.42</td>
<td>.237</td>
</tr>
<tr>
<td>Error</td>
<td>112</td>
<td>62.925</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
means indicates that externals (\(\bar{x} = 13.982, \text{S.D.} = 5.553\)) scored significantly higher on Need for Structure than did internals (\(\bar{x} = 12.098, \text{S.D.} = 4.106\)). Also, males (\(\bar{x} = 13.911, \text{S.D.} = 4.915\)) scored significantly higher on Need for Structure than did females (\(\bar{x} = 12.133, \text{S.D.} = 4.799\)).

### Table 2

#### Analysis of Variance of Need for Structure Factor Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus</td>
<td>1</td>
<td>113.578</td>
<td>4.95</td>
<td>.028</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>91.504</td>
<td>3.99</td>
<td>.048</td>
</tr>
<tr>
<td>Locus X Sex</td>
<td>1</td>
<td>4.622</td>
<td>0.20</td>
<td>.654</td>
</tr>
<tr>
<td>Error</td>
<td>112</td>
<td>22.940</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Table 3

#### Analysis of Variance of Multipotentiality Factor Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus</td>
<td>1</td>
<td>0.062</td>
<td>0.02</td>
<td>.887</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>10.304</td>
<td>3.38</td>
<td>.069</td>
</tr>
<tr>
<td>Locus X Sex</td>
<td>1</td>
<td>11.750</td>
<td>3.85</td>
<td>.052</td>
</tr>
<tr>
<td>Error</td>
<td>112</td>
<td>3.051</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Table 3 indicates that the Multipotentiality factor scores were not significantly related to the independent variables, although some non-significant trends could be noted. An inspection of cell means indicates that males ($\bar{x} = 4.446$, S.D. = 1.778) tended to score higher on Multipotentiality than did females ($\bar{x} = 3.850$, S.D. = 1.745). This trend must be qualified by the fact that there is a Locus of Control X Sex interaction that approaches significance. An investigation of cell means indicates that external males ($\bar{x} = 4.840$, S.D. = 1.546) tended to score higher on Multipotentiality than did internal males ($\bar{x} = 4.129$, S.D. = 1.910). However, external females ($\bar{x} = 3.567$, S.D. = 1.547) tended to score lower than did internal females ($\bar{x} = 4.133$, S.D. = 1.907).

Table 4 indicates that only sex was a significant contributor to the total variance of the Block factor scores.

Table 4
Analysis of Variance of Block Factor Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus</td>
<td>1</td>
<td>2.853</td>
<td>1.59</td>
<td>.209</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>9.537</td>
<td>5.33</td>
<td>.023</td>
</tr>
<tr>
<td>Locus X Sex</td>
<td>1</td>
<td>3.783</td>
<td>2.11</td>
<td>.149</td>
</tr>
<tr>
<td>Error</td>
<td>112</td>
<td>1.789</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
An inspection of cell means indicates that males ($\bar{x} = 3.857$, S.D. = 1.470) scored significantly higher on Block than did females ($\bar{x} = 3.283$, S.D. = 1.222).

Table 5 indicates that only locus of control was a significant contributor to the total variance of the Delay factor scores. An inspection of cell means indicates that externals ($\bar{x} = 6.000$, S.D. = 1.991) scored significantly higher on Delay than did internals ($\bar{x} = 4.967$, S.D. = 1.560).

### Table 5

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus</td>
<td>1</td>
<td>32.219</td>
<td>10.33</td>
<td>.002</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>4.498</td>
<td>1.44</td>
<td>.232</td>
</tr>
<tr>
<td>Locus X Sex</td>
<td>1</td>
<td>4.761</td>
<td>1.53</td>
<td>.219</td>
</tr>
<tr>
<td>Error</td>
<td>112</td>
<td>3.119</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Vocational Differentiation

Table 6 reports the results of the analysis of variance of traditional vocational differentiation scores. These scores were calculated by subtracting the lowest VPI scale score from the highest VPI scale score. The table indicates that only sex was a significant contributor to the total
variance of differentiation scores. An inspection of cell
means indicates that females ($\bar{x} = 8.400, \text{S.D.} = 3.243$)

Table 6
Analysis of Variance of Traditional Vocational Differentiation Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus</td>
<td>1</td>
<td>8.857</td>
<td>0.79</td>
<td>.376</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>44.486</td>
<td>3.96</td>
<td>.049</td>
</tr>
<tr>
<td>Locus X Sex</td>
<td>1</td>
<td>1.889</td>
<td>0.17</td>
<td>.682</td>
</tr>
<tr>
<td>Error</td>
<td>112</td>
<td>11.225</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

tended to score significantly higher on differentiation than
did males ($\bar{x} = 7.161, \text{S.D.} = 3.431$).

Table 7
Analysis of Variance of Revised Vocational Differentiation Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus</td>
<td>1</td>
<td>0.831</td>
<td>0.03</td>
<td>.853</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>0.830</td>
<td>0.03</td>
<td>.853</td>
</tr>
<tr>
<td>Locus X Sex</td>
<td>1</td>
<td>0.004</td>
<td>0.00</td>
<td>.967</td>
</tr>
<tr>
<td>Error</td>
<td>112</td>
<td>2.405</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Table 7 reports the results of the analysis of variance of revised vocational differentiation scores. These scores were calculated according to Cole's spatial configurational procedure. The table indicates that none of the factors was a significant contributor to the total variance of the revised vocational differentiation scores.

**Relationships Among the Dependent Variables**

Table 8 reports the results of the correlational analyses performed on the dependent variables in this study. There were 12 significant correlations.

As might be expected, the total indecision score from the Career Decision Questionnaire was highly correlated with each of the four factor scores. The factor scores were also highly correlated with one another.

The vocational differentiation scores computed according to Cole’s procedure accounted for two of the significant correlations. This measure (Dif-R) correlated significantly with the Delay factor score of the Career Decision Questionnaire, indicating that persons with high differentiation scores also tended to obtain high scores on the Delay factor. This measure of differentiation (Dif-R) also correlated highly with the traditional method for calculating differentiation (Dif-T).
Table 8

Relationships Among Vocational Indecision Total and Factor Scores and Two Measures of Vocational Differentiation

<table>
<thead>
<tr>
<th></th>
<th>Indecision</th>
<th>Structure</th>
<th>Multipotentiality</th>
<th>Block</th>
<th>Delay</th>
<th>Dif-T</th>
<th>Dif-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indecision</td>
<td>1.00</td>
<td>.94**</td>
<td>.66**</td>
<td>.67**</td>
<td>.74**</td>
<td>-.06</td>
<td>.07</td>
</tr>
<tr>
<td>Structure</td>
<td></td>
<td>1.00</td>
<td>.48**</td>
<td>.54**</td>
<td>.60**</td>
<td>-.13</td>
<td>-.02</td>
</tr>
<tr>
<td>Multipotentiality</td>
<td></td>
<td></td>
<td>1.00</td>
<td>.36**</td>
<td>.39**</td>
<td>.08</td>
<td>.12</td>
</tr>
<tr>
<td>Block</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>.39**</td>
<td>-.05</td>
<td>.07</td>
</tr>
<tr>
<td>Delay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>.04</td>
<td>.20*</td>
</tr>
<tr>
<td>Dif-T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>.64**</td>
</tr>
<tr>
<td>Dif-R</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>

* p < .05
** p < .01
Summary

Seven separate analyses of variance were performed. In three of them, locus of control was found to be a significant contributor to total variance. Externals scored higher than internals on total vocational indecision and on the Need for Structure and Delay factor scores.

In four analyses, sex was found to be a significant contributor to total variance. Males scored higher than females on vocational indecision and on the Need for Structure and Block factor scores. A non-significant trend was also noted for the Multipotentiality factor scores on which males again scored higher than females. Females scored higher than males on the traditional measure of vocational differentiation.

Two significant correlations were found that were of interest to this study. The revised measure of differentiation was positively correlated with the Delay factor scores and positively correlated with the traditional measure of differentiation.
CHAPTER V
DISCUSSION AND CONCLUSIONS

The purpose of this chapter is to (1) discuss the data analysis in relationship to the experimental hypotheses of the study, (2) suggest limitations in the current study and implications for further research, and (3) draw conclusions from the study.

Relationships Between Data and Experimental Hypotheses

Hypothesis 1 stated that vocational indecision would differ as a function of locus of control and that high levels of indecision would be associated with an external locus of control. This hypothesis would be supported by a significant Locus of Control effect in the analysis of variance.

A main effect due to Locus of Control was found in three of the analyses and the effect was in the hypothesized direction. This suggests that the externally oriented individual is characterized by a set of traits (low achievement motivation, lack of information-seeking behavior, unwillingness to attempt to control the environment, belief in the forces of chance in determining the direction of one's
life) which are dysfunctional to the process of making a vocational choice. This would seem to speak strongly for the position that, in counseling, "effort should be spent in developing ways to help individuals determine what can be controlled and how to do so" (Osipow, 1969, pg. 19).

Additional support for this position is provided by the fact that externally oriented individuals scored significantly higher than internally oriented individuals on the Need for Structure factor of the Career Decision Questionnaire. As Kazin (1977) noted, persons with high scores on this factor seem to be endorsing items that indicate a lack of occupational information and a lack of knowledge about one's own abilities and interests. This is precisely the pattern one might expect from the externally oriented individual who shows a lack of information-seeking behavior.

It should be noted that the relationship between locus of control and the Delay factor of the Career Decision Questionnaire could be conceptualized in the same manner. Kazin (1977) defined this factor as representing "a temporary halt in progress following an initial decision which is apparently satisfactory" (pg. 28). In this case, the individual may be requesting reassurance. Again, the individual seems to be needing some structure imposed from an external source.

It is interesting to note that only these two factors showed a significant relationship with locus of control.
All four factors showed significant correlations with the total indecision score and it might have been expected that all four would show similar relationships to locus of control. However, only the two factors that seem to contain items closely related to locus of control did show this relationship. It seems that the factors of the Career Decision Questionnaire do measure distinctly different elements of indecision.

Hypothesis 2 stated that traditional measures of differentiation would differ as a function of locus of control and that high levels of differentiation would be associated with an internal locus of control. This hypothesis would be supported by a significant Locus of Control effect in the analysis of variance.

This main effect was not found and the hypothesis is not supported. Figure 3 displays the mean VPI profiles of the external and internal groups. The profiles are virtually identical, suggesting that both groups would obtain similar mean differentiation scores. Furthermore, it appears that both groups have fairly well-defined interests resulting in relatively high levels of differentiation. There may be at least two reasons for this.

First, S's were asked to indicate academic major and vocational aspiration in supplying background information. An examination of this self-report data indicates that the sample contains a high percentage of individuals in Social
Mean Number of Items Endorsed

External Group

Internal Group

Figure 3

Mean VPI Profiles: Internal and External Groups
and Artistic majors or with Social or Artistic vocational aspirations (education, social science, etc.). This over-representation may have been strong enough to mask the effects of locus of control. That is, having Social or Artistic interests may be sufficient to provide an individual with a well-defined (highly differentiated) profile irrespective of locus of control orientation.

A second explanation for the lack of significant findings is also possible. An implicit assumption of this study was that the behavior correlates of an external locus of control (lack of information-seeking behavior, low achievement and low achievement motivation) would produce an individual with a poorly defined set of interests and thus with an undifferentiated VPI profile. However, several studies (Crowne and Liverant, 1963; Getter, 1966; Gore, 1962) have suggested that externally oriented persons are more conforming to external forces. Thus, it is possible that externally oriented persons have been exposed to significant forces in their environments (parents, teachers, counselors) which have shaped their interests into well-defined patterns.

Hypothesis 3 stated that revised measures of differentiation would differ as a function of locus of control and that high levels of differentiation would be associated with an internal locus of control. This hypothesis would be supported by a significant Locus of Control effect in the analysis of variance.
This main effect was not found and the hypothesis is not supported. The possible reasons for this would be similar to the reasons given for non-support of Hypothesis 2.

Hypothesis 4 stated that traditional differentiation scores would be positively correlated with revised differentiation scores. A significant, positive correlation was found and the hypothesis is supported.

It appears that the two methods for obtaining differentiation scores are measuring similar constructs. The high correlation may be partly due to the fact that both measures are obtained from the same sets of six VPI scale scores. In fact, it seems reasonable to have expected an even higher correlation than was obtained. Differences in the two measurements may be due to the fact that Dif-T is a raw score and Dif-R is a measure using standardized scores.

Hypothesis 5 stated that traditional differentiation scores and vocational indecision scores would be negatively correlated. Correlations were performed between traditional differentiation scores and five measures of indecision (the Career Decision Questionnaire total score and the five factor scores). No significant correlations were found and the hypothesis is not supported.

It was assumed that persons with undifferentiated profiles would lack direction in selecting a vocation and thus would obtain high indecision scores. However, it appears that specificity of interests is not related to indecision.
This conclusion runs counter to the tentative conclusions drawn by Kazin (1977), Lunneborg (1975), and Baird (1968). However, evidence that specificity of interests does not distinguish decided from undecided students was presented by Ashby et al. (1966) and Harman (1973).

A possible reason for the lack of support for this hypothesis can be found by a visual examination of the individual profiles of the S's completing the VPI. It appears that there are two different kinds of undifferentiated profiles. The first type is relatively flat (undifferentiated) and shows a low interest level. The is, the S indicated liking very few of the occupations on the VPI. This low endorsement level may be related to indecision. Harman's (1973) study would support this interpretation.

A second type of profile is also flat (undifferentiated) but shows a very high interest level. The S indicated liking many of the occupations on the VPI. This type of undifferentiation would seem to be unrelated to indecision. The S's with this type of profile may have been comfortable with their wide range of interests and did not perceive this as a barrier to selecting an occupation. It may be that interests not implemented in the vocational choice would be implemented in recreational or avocational activities.

Hypothesis 6 stated that revised differentiation scores and vocational indecision scores would be negatively correlated. Again, five correlations were performed. Only one
correlation was significant, but it was not in the predicted direction. Hypothesis 6 is not supported.

The revised measure of differentiation was positively correlated with the Delay factor score of the Career Decision Questionnaire. This indicates that high levels of differentiation are associated with high scores on the Delay factor. An examination of the items on this factor would suggest that the positive correlation may be appropriate.

If an $S$ agrees with items on the Delay factor, the $S$ is indicating that some choices have been made. Thus, the factor may be interpreted as a measure of a certain degree of decidedness. If differentiation of interests is positively correlated with decidedness, then it is the individual with highly differentiated interests who will agree with the items on this factor, causing a positive correlation. Of course, this sequence of events is purely conjecture as a positive correlation between decidedness and differentiation was not proved in this study.

Other findings. It was not the stated purpose of this study to examine the sex differences in the variables under consideration. However, sex was included as an independent variable because it could not be assumed, on the basis of the current literature, that scores on the variables were independent of sex. The lack of any significant Locus of Control X Sex interactions indicates that the main effects due to Locus of Control are independent of the sex of the $S$. 
However, in several instances, Sex did prove to be a significant contributor to the total variance of the variables under consideration. These findings deserve mention and will be discussed below.

Males scored significantly higher than females on the total indecision score and on two factor scores of the Career Decision Questionnaire. A tendency to score higher on a third factor approached significance. There is no significant literature that would supply a reason why males would be more vocationally undecided than females. One possibility is that males have traditionally had more careers open to them than females. This breadth of choice may contribute to vocational undecidedness.

An examination of VPI profiles supports this interpretation. Figure 4 displays the mean VPI profiles for males and females. It is clear that females have a much more highly differentiated profile than do males. This observation has been proved statistically. Sex was a significant contributor to the total variance of the traditional differentiation scores. Females scored significantly higher than did males. Thus, it is again suggested that high levels of differentiation are associated with low levels of indecision. The highly differentiated females scored significantly lower than males on several measures of indecision.
Figure 4

Mean VPI Profiles: Male and Female Groups
Limitations and Implications

Limitations in the generalizability of the findings of this study arise from the nature of the experimental sample. The overall male sample in this study received a mean I-E Scale score of 11.25. The overall female sample received a mean score of 11.72. Rotter (1966) reports mean scores of 8.15 and 8.42, respectively, for his male and female samples. These latter means are even lower (i.e. more internal) than the mean scores obtained by the male and female internal groups in the present study (8.42 and 8.70 respectively). Thus, the sample in the present study seems to be more externally oriented overall than the samples studied by Rotter. It is not apparent why this has happened. It is possible that the sample is an atypical one and that a sample drawn during another time in the year would have been more similar to Rotter's samples. It is also possible that Introductory Psychology students have become more externally oriented over the years.

It has already been noted that the sample seems to contain a high percentage of persons from Social and Artistic orientations. Samples drawn from other populations of the university student body may be more heterogeneous and may have resulted in different data. The results of this study should be generalized to other groups with caution.

In the process of carrying out this research, several avenues of further study suggested themselves. It seems
that more research should be done on Holland's construct of differentiation. While several results of this study indirectly suggest that differentiation is related to indecision, no direct statistical test was able to prove that such a relationship existed. This may be due to the fact that the relationship does not exist in reality. It is also possible that the methods devised for measuring differentiation are at fault. Such a possibility has been suggested by Cole et al. (1971). It should also be noted that at least two other methods of measuring differentiation have been used (Frantz and Walsh, 1972; Spokane, 1976). Research needs to be conducted that will indicate exactly what each of these methods is measuring and which is closest to the theoretical sense of the construct.

It has also been noted that this study did not distinguish between the two different types of differentiation (low and high interest level). The possibility exists that there are different types of differentiation and that these types have different implications for vocational behavior. The failure to make such a distinction in the present study may be viewed as an additional limitation.

It is hoped that additional research will be conducted with the Career Decision Questionnaire. The results of this study suggest that it is not only a useful instrument for measuring indecision, but that it may also prove to be a useful instrument for measuring different types of
indecision. Use of the four factor scores may aid in the development of an "Indecision Profile". This profile would help counselors in working with undecided clients.

Conclusions

The purpose of this study was to investigate the relationship between a major personality construct (locus of control) and two subordinate constructs from vocational psychology (vocational indecision and vocational differentiation). The following tentative conclusions are drawn from the study:

1. There is a significant relationship between vocational indecision and locus of control. High levels of indecision are associated with an external locus of control.

2. Vocational differentiation does not appear to be directly related to locus of control.

3. Vocational differentiation does not appear to be directly related to vocational indecision. However, some indirect evidence for the relationship was found. Further research may prove that high levels of indecision are associated with low levels of differentiation.

4. Cole's configurational method of measuring differentiation is positively correlated with the traditional method. However, additional research is needed to define the nature of the relationship.
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