INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.

2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.

3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of "sectioning" the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.

4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.

5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.

University Microfilms International
300 N. Zeeb Road
Ann Arbor, MI 48106
Donaldson, Scott Lewis

PSYCHOLOGICAL DIFFERENTIATION AND ITS RELATIONSHIP TO ACADEMIC, INTRAPERSONAL, AND INTERPERSONAL DOMAINS AMONG COLLEGE STUDENTS

The Ohio State University

University Microfilms International 300 N. Zeeb Road, Ann Arbor, MI 48106

Copyright 1985
by
Donaldson, Scott Lewis
All Rights Reserved
PSYCHOLOGICAL DIFFERENTIATION AND ITS RELATIONSHIP TO ACADEMIC, INTRAPERSONAL, AND INTERPERSONAL DOMAINS AMONG COLLEGE STUDENTS

DISSERTATION

presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

Scott Lewis Donaldson, B. S., M.Div., M.A.

**************

The Ohio State University

1984

Reading Committee:

Steven W. Leclaire, Ph.D
Henry Leland, Ph.D.
Donald J. Tosi, Ph.D

Approved By

Advisor
Faculty of Special Services
This dissertation is dedicated to my wife
Ruth Elaine, without whose love, encouragement,
support, and graciousness I could never
have achieved this goal.
Acknowledgements

The author is indebted to many people who made the completion of this dissertation possible:

My loving wife Ruth provided support, assistance, patience and encouragement throughout my laborings over rough drafts, test batteries and computer print-outs.

Dr. Steven W. Leclair, my dissertation chairperson, provided me with both support for doing what I wanted, and challenges and constructive criticism to do it better. I am grateful for his patience with me.

Dr. Herman Peters, my advisor, whose patience and encouragement were greatly appreciated.

Dr. Henry Leland, whose abilities as a teacher and clinician I greatly admire, I appreciate his willingness to serve as a committee member on my general examination committee as well as on this committee.

Dr. Donald Tosi, for the example he has set as a teacher, researcher, and clinician.

Mr. Murray Hudson, Dean of Students at Ashland College for permitting and encouraging me to complete my graduate work while employed at Ashland College.
Dr. John Fraas, Professor of Economics at Ashland College for his consultation regarding the analysis of this data.

Mrs. Ella Copeland, Reference Librarian for her willingness to conduct endless computer searches and for her support.

Mr. Mark Solomon, a graduate student whose has willingly performed many tedious tasks.

Dr. Jerry Cole, Ann Heiffner, Kim Donaldson, Kim Strauss, Dr. Richard Kriens, Dr. Duncan Jameison, Winfred Kitchen, Lleslie Donaldson whose efforts were greatly appreciated.

Scott Kristian, Jeffrey Barrett, and Gregory Douglas, my children who provide a rich and vital dimension to living.

Finally, to all the family members and friends who provided moral support and encouragement during my commitment to the completion of this study, THANK YOU.
VITA

July 12, 1948 ........................................ Born, Pittsburgh, Pennsylvania

1970 .............................................................B. S., Ashland College, Ashland Ohio. Major: Psychology

1977 .............................................................M.Div., Ashland Theological Seminary, Ashland, Ohio. Major: Pastoral Counseling

1978 ...........................................................M. A., The Ohio State University, Columbus, Ohio. Major: Counseling and Guidance

1979. ...........................................................Director, Ashland County Alcohol Center. Ashland, Ohio.

1980. ...........................................................Director, Counseling and Student Development Center, Ashland College. Ashland, Ohio.

1981. ..............................................................Instructor, Department of Psychology, Ashland College. Ashland, Ohio.

MAJOR AREAS OF STUDY

Guidance and Counselor Education: Dr's Herman Peters and Donald J. Tosi

Developmental Psychology: Dr. Henry Leland
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEDICATION</td>
<td>ii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>iii</td>
</tr>
<tr>
<td>VITA</td>
<td>v</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>viii</td>
</tr>
</tbody>
</table>

## CHAPTER ONE: INTRODUCTION

- Introduction.................................................. 1
- Need for the Study........................................... 5
- Purpose.......................................................... 7
- Research Questions.......................................... 7
- Definition of Terms......................................... 8
- Limitations of This Study................................. 11

## CHAPTER TWO: REVIEW OF THE RESEARCH LITERATURE

- Psychological Differentiation.......................... 13
- Intelligence and Cognitive Style...................... 18
- Academic Evolution During the College Years......... 22
- The Teaching-Learning Process.......................... 26
- Personality Characteristics............................ 30
- Summary......................................................... 37

## CHAPTER THREE: METHODOLOGY

- Introduction.................................................. 40
- Setting......................................................... 40
- Sample.......................................................... 40
- Procedure...................................................... 41
- Selection of Instruments.................................. 44
  - Group Embedded Figures Test.......................... 44
  - Draw-a-Person Test........................................ 51
  - California Psychological Inventory.................. 57
- Research Design.............................................. 66
- Statistical Analyses........................................ 66
- Summary......................................................... 67
<table>
<thead>
<tr>
<th>CHAPTER FOUR: RESULTS</th>
<th>page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>69</td>
</tr>
<tr>
<td>Overview of Purpose, Research Design, and Statistics</td>
<td>69</td>
</tr>
<tr>
<td>Demographic Data</td>
<td>71</td>
</tr>
<tr>
<td>Primary Research Questions</td>
<td>73</td>
</tr>
<tr>
<td>Summary</td>
<td>83</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER FIVE: SUMMARY, CONCLUSIONS, DISCUSSION, RECOMMENDATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary</td>
</tr>
<tr>
<td>Conclusions</td>
</tr>
<tr>
<td>Discussion</td>
</tr>
<tr>
<td>Recommendations</td>
</tr>
</tbody>
</table>

LIST OF REFERENCES                                               96
LIST OF TABLES

Table | Page
---|---
1. Number Correct: Group Embedded Figures Test | 48
2. Validity Coefficients: Group Embedded Figures Test | 50
3. Characteristics of Drawings Reflecting Level of Sophistication | 53
4. Sophistication of Body Concept Scale Rating | 56
5. Coefficients of Stability: California Psychological Inventory | 62
6. Internal Consistency Coefficients: California Psychological Inventory | 63
7. Range, Median and Mean Ages of Student Groups | 72
8. Group Means and Standard Deviations for Students who were Field Dependent or Field Independent | 74
9. Results of ANOVA on Field Dependence-Independence Scores of Class and Sex | 75
10. Results of ANCOVA on Academic Achievement of Class and Sex | 77
11. Results of ANCOVA on Social Adjustment of Class and Sex | 79
12. Results of ANCOVA on Perceived Satisfaction of Class and Sex | 80
13. Results of ANCOVA on Sophistication of Body Concept of Class and Sex | 82
14. Results of ANCOVA on Level of Conceptual Maturity of Class and Sex | 84
Chapter One

Introduction

A symposium on "Personal and Social Factors in Perception" was conducted at the annual meeting of the American Psychological Association in 1949 to consider research that had been conducted on cognitive-style. Klein and Schlesinger (1949) in a paper entitled "Where is the Perceiver in Perceptual Theory?" emphasized the phenomenological approach. They underscored the need to examine the perceiving of an individual within the context of his/her personality structure, needs, interests and values versus comparing a perception in one individual with that of others. "Such an approach inevitably draws attention to the adaptive role of perceiving in the psychological economy of the individual" (Witkin & Goodenough, 1981, p. 1).

Field dependence-independence is a cognitive style that has been identified by Witkin, Dyk, Faterson, Goodenough, & Karp (1962). Their research efforts began with studies of perception of the upright (Asch & Witkin, 1948a, 1948b). During these studies, it was observed that subjects (S's) performed orientation tasks in different manners. Some S's were able to establish the upright consistently across tasks while other S's were consistent in their inability to establish the upright across tasks. "This suggested that people have preferred ways of
integrating the diverse sources of information available to them for locating the upright" (Witkin et al., 1981, p. 7). S's either relied on the external field or on their bodies in locating the upright. Those who relied on the external field were thought to be field dependent, whereas those who used their bodies in locating the upright were labeled as field independent.

One mode of locating the upright is not thought of as being better or worse than the other. Witkin et al. (1981, p. 14) stated that reliance on the body would produce more accurate performance in some situations while reliance on the field would lead to more accurate performance in other situations.

Following initial studies of perception of the upright, Witkin, Lewis, Hertsman, Machover, Meissner, and Wapner (1954) attempted to refine the above data by introducing tasks which required S's to separate an item (body or rod) from an organized field (room or frame). The embedded-figures test (EFT) was designed to assess S's ability to extract or disembed a simple figure from a complex design.

It was found that subjects who had difficulty separating the sought-after simple figure from the complex design were the ones who could not easily keep body or rod separate from room or frame in the orientation tests—in other words, were the ones who were field dependent (Witkin & Goodenough, 1981, p. 15).

"Field dependence-independence was thus specifically conceived to be a perceptual-analytical ability that manifests itself pervasively throughout an individual's perceptual functioning" (Witkin &
Further research revealed that disembedding ability in perception was positively correlated with specific intellectual activities, that is, problem solving ability. S's who were determined to be field dependent also had difficulty extracting critical elements needed to solve a problem from the context and restructuring the problem material so that the elements could be used in a different context. Field independent S's tended to impose structure on a field to "break up the organized pattern so as to expose the embedded figure" (Witkin & Goodenough, 1981, p. 17).

Thus, "analysis and structuring were viewed as complementary aspects of articulation" (Witkin & Goodenough, 1981, p. 18). S's who experience in an articulated fashion were able to separate items from their backgrounds, and could impose structure on a field that had little structure. Witkin et al. (1981) have labeled this ability as an articulated-field-fashion whereas S's who were not able to separate items from the backgrounds and who could not impose structure on a field that had little structure have been labeled as exhibiting a global-field-approach.

Subsequent research (Witkin et al. 1962; Witkin et al. 1954) indicated that the concepts of field-dependence versus field-independence and articulated versus global-field-approach could be expanded to include personality dimensions, that is, controls, defenses, body concept, and the self. These dimensions were described as: 1, having a definite ordering during ontogenetic (the life cycle of
the individual) development; 2, having typical ways of manifesting themselves based on given structural arrangements (Witkin et al. 1981, p. 18); 3, exhibiting stability over time; and 4, having either some degree of specialization or reflecting a degree of separateness of the self from the selves of others. Witkin et al. (1981, p. 18) stated that these features are distinguishing properties of a more or less differentiated system. Therefore, the concept of differentiation is used to describe the "linked areas of psychological functioning and their common fate during development" (Witkin et al. 1981, p. 18-19).

In briefer outline, differentiation is a structural property of an organismic system. Particular formal arrangements, determined by a given degree of differentiation, influence the development of characteristic ways of functioning. In fact, it is through particular manifestations that degree of differentiation of a system may be judged (Witkin et al. 1981, p. 19).

Characterizing a system as more differentiated implies the following: segregation of self from nonself, with boundaries established between an inner core, experiences as the self, and nonself; separation of psychological activities e.g., thinking from acting, feeling from perceiving, and the ability to extract independent specific functions within each activity yet to exhibit them as "interrelated into a hierarchial structure, making them integral constituents of an articulated system" (Witkin et al. 1981, p. 19); and specialization of function at a neurophysiological level as much as at a psychological level.
Witkin et al. (1981) stated that since development of differentiation is organism wide, indicators of differentiation (cast in favor of greater differentiation) are as follows: an articulated field approach in cognitive functioning; a sense of separate identity allowing the individual to function autonomously; an articulated body concept with definite boundaries and yet with an interrelated structure; and access to controls for channeling impulses and the use of specific defenses in specific situations versus the use of global defenses in a variety of situations.

In summary, the concept of differentiation has served to provide a parameter for understanding the individual's style of functioning within the cognitive, affective, interpersonal and neurophysiological domains.

Need For The Study

Experimental studies by Witkin and others have demonstrated that individuals differ in the way they perceive themselves, others, and their environment. Several experimental studies have used college students as subjects in an attempt to understand what, if any, relevance cognitive-personal style has on college students, for example, the relationship between cognitive style and verbal skills; the relationship between cognitive style and vocational interest pattern. Yet, no attempt has been made to understand what, if any,
relationship exists between a college student's cognitive/personal style and academic and social domains. Specifically, it appears that academic and social aspects interact either to provide a basis for success in college as measured by a sufficient grade-point-average to graduate and/or to receive acceptance into graduate school or a vocational opportunity or to cause the student to fail.

What impact does cognitive/personal style have on the interaction of academic/social aspects as they provide for success or failure of the college student? Does one particular cognitive style, that is, field-dependence or field-independence provide a college students with a greater capacity for the integration of academic and social aspects of college? Does one particular cognitive style, that is, field-dependence or field-independence allow for academic and social aspects of college to become more consistent as a student's academic career progresses? Does one particular cognitive style, that is, field-dependence or field-independence as it relates to measures of academic and social aspects provide for perceived satisfaction with a particular college program?

Therefore, college students' cognitive/personal style and its relationship to academic and social domains was selected as an experimental means for assessing the interactive effect, integration, consistency, growth as well as satisfaction with subjects' academic endeavors.
The purpose of this study is to determine whether differences exist in the cognitive/personal style of college students as it interacts with academic adjustment, social adjustment, perceived satisfaction with subjects' academic endeavors, sophistication of body concept and level of conceptual maturity. Do these factors provide for success or failure in college? Are there significant changes in these measures between the freshmen and junior years?

The investigator will respond to the above areas by gathering data to answer the following research questions:

1. What differences exist among the group means of a measure of the field dependent-independent dimension of college freshmen males, college freshmen females, college junior males and college junior females?

2. What differences exist among the group means of a measure of academic achievement of college freshmen males, college freshmen females, college junior males and college junior females when the effect of field dependence-independence is removed?

3. What differences exist among the group means of a measure of social adjustment of college freshmen males, college freshmen
females, college junior males and college junior females when the effect of field dependence-independence is removed?

4. What differences exist among the group means of a measure of perceived satisfaction with academic endeavors for college freshmen males, college freshmen females, college junior males and college junior females when the effect of field dependence-independence is removed?

5. What differences exist among the group means of a measure of sophistication of body concept for college freshmen males, college freshmen females, college junior males and college junior females when the effect of field dependence-independence is removed?

6. What differences exist among the group means of conceptual maturity for college freshmen males, college freshmen females, college junior males and college junior females when the effect of field dependence-independence is removed?

**Definition of Terms**

The following definitions are presented for a more thorough understanding of terms used throughout the study:
College student: The term college student will include males and females who are enrolled as full-time students (enrolled for 12 or more semester hours per semester) who are at least 17 years old. Subject pools will be selected from college students enrolled at a small midwestern liberal arts college with an enrollment of 1250 full-time, on campus undergraduate students.

Cognitive/personal style: The term cognitive/personal style will be defined by using Witkin's et al. (1962) field dependence-independence dimension (FDI). The field-dependent student will be described as having a less clearly defined body concept, an identity that tends to be merged with others, less impulse control, and less articulation of experiences of the world. In contrast, field-independent students will be described as having a more clearly defined body concept, a growing sense of separate identity, greater impulse control and an articulation of experiences of the world. The Group Embedded Figures Test (GEFT) will be used to make an initial assessment of students' cognitive/personal style.

Academic achievement: This term will be measured by examining subjects' college cumulative grade point average. High school and college grade point averages of 2.50 or above will be considered indicative of academic achievement. High school and college cumulative averages of less than 2.50 will not be considered indicative of academic achievement.
Social adjustment: This term will be measured by using the California Psychological Inventory; specifically using Factors I and II. Well-being (Wb), Responsibility (Re), Socialization (So), Self-control (Sc), Tolerance (To), Good Impression (Gi), Achievement via Conformance (Ac), Achievement via Independence (Ai), and Intellectual Efficiency (Ie) constitute Factor I. Dominance (Do), Capacity for Status (Cs), Sociability (Sy), Social Presence (Sp), and Self-Acceptance (Sa) constitute factor II. Mean T scores on Factors I and II of less than 50 will not be considered indicative of social adjustment.

Perceived satisfaction: with subjects' academic endeavors will be rated by use of the Intellectual Efficiency (Ie) scale of the California Psychological Inventory. A T-score of 45 or greater will be indicative of perceived satisfaction with his/her academic endeavors. A T-score of less than 45 will not be indicative of subjects' perceived satisfaction with his/her academic endeavors.

Sophistication of Body Concept: Subjects' degree of sophistication of body concept will be rated by use of the "Sophistication of Body Concept Scale Rating" applied to the Draw-A-Person Test. A scale rating of 1 or 2 will indicate that the subject does have a sophisticated body concept. A Scale rating or 3, 4, or 5 will indicate that subjects do not possess a sophisticated body
concept.

**Conceptual Maturity:** In this study, conceptual maturity will be defined as:

1, the ability to perceive, that is, to discriminate likenesses and differences; 2, the ability to abstract, that is, to classify objects according to such likenesses and differences; and 3, the ability to generalize, that is, to assign an object newly experienced to a correct class, according to discriminating features, properties, or attributes (Harris, 1963, p. 5).

**Limitations Of This Study**

The study is limited to a sample of 100 students, 50 freshmen and 50 juniors who are enrolled in undergraduate programs at a midwestern liberal arts college. One group of subjects who participated in this study are students in a college freshmen Contemporary Issues class (a two-semester on-going orientation program) taught by faculty members from various departments and disciplines. Students were assigned to these classes as the college received their enrollment deposit. The course was offered from 2:00-3:00 in the afternoon on Monday and Wednesday. The educational level of the freshmen group consisted of a high school education and one semester of college.

The second group of subjects who participated are classified as second semester juniors (having completed more than 60 semester hours).
They were selected randomly from the Schools of Arts and Humanities, Sciences, Business, and Education. The educational level of college juniors consists of a high school diploma and at least 60 hours of college courses.

This study is not longitudinal in nature, thus limiting the generalizability of the results.
Chapter Two

The purpose of this chapter is to present a selected review of the literature of psychological differentiation as it relates to intelligence, academic evolution during the college years, the teaching-learning process and personality characteristics. Finally, a summary will be presented.

Psychological Differentiation

Human ontology progresses with increasing polarity between the self and the non-self. The concept of differentiation or a field independent orientation can be defined as a marked separation between self and non-self to the extent that the individual is able to separate him/herself from the field; whether the field be other individuals, perceiving, or using his/her body. The field independent orientation "suggests consistency of psychological functioning which pervades the individual's perceptual, intellectual, emotional, motivational, defensive and social operations" (Witkin, Dyk, Paterson, Goodenough, and Karp, 1962, p. 4). In addition, there appears to be a marked continuity in these aspects of functioning over long periods of time. Witkin et al. (1962) have labeled this orientation "field-independence." More limited differentiation of the above
mentioned psychological functions have been labeled field-dependence.

Witkin et al. (1962) distinguished people who were more field-dependent from those who were more field independent. The "extent of definition of self-concept, articulativeness of body image, and method of impulse regulation have formed an interrelated cluster which is apt to be considered in evaluating people as more differentiated or less differentiated." (Witkin et al. 1962). A highly differentiated system is evident in a person with a heterogeneous structural state (field-independence), that is, a clearly defined body concept, a growing sense of separate identity, greater impulse control, and an articulation of experiences of the world. A less highly differentiated system is likened to a person with a homogeneous structural state (field-dependence), that is, a less clearly defined body concept, an identity that is merged with others, less impulse control, and less articulation of experiences of the world.

The hallmark "of the functioning of a highly differentiated system is specialization" (Witkin et al. 1962 p. 9). The mediation of specific functions within a general system include: 1, the separation of psychological functions e.g., feeling from perceiving and thinking from acting; 2, the occurrence of specific vs. diffuse reactions to stimuli; and 3, the perception that portions of a designated field are perceived as discrete verses fused in their background representing subsystems within the general system. Thus, "psychological differentiation manifests itself in behavior by a variety of indicators
pervading the whole psychological organization from perception and intellectual activities to personality" (Witkin et al. 1962 p. 10).

The concept of psychological differentiation has been dealt with by a host of other researchers. Werner (1948) stated that "development of biological forms is expressed in an increasing differentiation of parts and in increasing subordination, or hierarchization" (p. 41).

"The primitive personality is more syncretic than the personality on higher levels in that the primitive individual feels himself less separated from other living entities, whether these be man, animal, or the social world that he is a part" (Werner 1948, p. 433).

A symposium on "Personal and Social Factors in Perception" was conducted at the annual meeting of the American Psychological Association in 1949 to consider research that had been conducted on psychological differentiation. Brunner & Krech (1950) and Blake and Ramsey (1951) also considered the relationship between personality and perception, as well as Witkin, Lewis, Hertzman, Machover, Meissner and Wapner (1954); and Gardner, Jackson, and Messick (1960). From this broad stream of research, the concept of psychological differentiation emerged. The thrust of this research appears to be summarized by Klein and Schlesinger (1949): the pivotal role must be assigned to "conceptualizing perception-personality relationships to a central adapting, regulating personality structure, which enters into all functioning, including perceiving."
Early in their work, Witkin et al. (1954) discovered that the FDI dimension had a consistent developmental curve. Younger children tended to be more field dependent whereas adolescents tended to be more field independent. Longitudinal studies designed to investigate the stability of differentiation were conducted on three groups of children: one group in the period of infancy-9 years; a second group in the period of 8-13 years; and the third group in the period of 10-17 years. Changes of progression were not in the areas of mode of field approach and extent of articulation of body concept, however the greater degree of analytical perception indicated a change as a whole. "Yet, in the context of vast psychological change, children who at age 10, relative to their group, gave evidence of more developed differentiation in the areas considered, tended to have the same relative standing in the group at age 17" (Witkin et al. 1962, p. 380). Therefore, Witkin et al. (1962) concluded that the differentiation (more or less developed) trends are a stable characteristic of the maturing child.

Witkin et al. (1962) reported on the status of stability of more or less developed differentiation.

Long-range studies of adults, some extending over a period of more than three years, showed a pattern of generally high and significant test-retest correlations for measures reflecting extent of development of differentiation in the areas of functioning considered (Witkin et al. 1962 p. 379).
Limitations of the differentiation hypothesis include: 1, that some areas of the child's development may be more differentiated than others; 2, that dedifferentiation (or the loss of differentiation) may occur for a variety of reasons, for example, poorly understood psychological causes; brain damage, and so forth; 3, that there is no way to isolate determinants used to measure differentiation from other determinants; and four, that from time to time, different levels of differentiation may be found in the same individual.

Witkin et al. (1962) have developed tests designed to measure the field-dependence-independence FDI construct. "The objective of these tests is to extract (or manipulate) an item as part of an organized cognitive (perceptual or representational) field" (Pascual-Leone, 1969, p. 48). In the body adjustment test (BAT) a subject is requested to attempt to represent his/her body position in space. The intention of the test is to evaluate the subject's ability to perceive his/her position. The Rod-And-Frame Test (RFT) involves a slightly different procedure. In this instance, the subject is asked to align a rod with the objective vertical. A third measure used to assess FDI is the Embedded-Figures Test (EFT). The intent is for subjects to locate geometrical figures within a complex design that has been organized to conceal the geometrical figure. Thus a subject is evaluated on his/her ability to "overcome" or "breakdown" the embedded context in order to extract or manipulate objects concealed by it.

Thus, cognitive style appears to have a consistent, long-term effect on an individual's perceptual, intellectual, emotional,
motivational, defensive, and social operations. It includes self concept, impulse regulation and articulation of life experiences. Tests designed by Witkin et al. (1962) appear to indicate the consistency of cognitive style.

**Intelligence and Cognitive Style**

As a means of understanding analytical functioning more precisely, Witkin et al. (1954) stated that the individual differences found in the area of perception may have their counterpart in intellectual functioning.

It is likely—and this is of course subject to experimental test—that if a person has this basic ability to 'break up' a configuration it will be manifested not only in straightforward perceptual situations, but in problem solving situations as well (Witkin et al. 1964, p. 477).

Woerner and Levine (1950) administered the Wechsler Intelligence Scale for Children (WISC) to a group of 12-year-old children. When comparing scores on the WISC with scores derived from a perceptual battery of tests, there was a significant relationship. Scores on the perceptual battery and WISC Performance subtest scores were more highly related than scores on the perceptual battery and WISC verbal scores. The high relationship between the perceptual battery and the WISC Performance Subtest, Block Design indicated that "aspects of intelligence which involve analytical ability might be contributing
heavily to the over-all relation found between full scale intelligence and perception" (Witkin et al. 1962, p. 59). Factor-analytical studies of the matrix of intercorrelations among WISC Subtests and the conceptual tests for 12-year-old males and females and 10-year-old males were conducted by Goodenough & Karp (1962). Three factors emerged: I, verbal comprehension; II, attention-concentrating; and III, analytical field approach. Factor III, analytical field approach had the highest loading, thus providing "further evidence of overlap among field dependence, spatial decontextualization and flexibility of closure" (Witkin et al. 1962, p. 69).

The dimension of individual differences with which we are dealing thus represent at its extremes, contrasting ways of approaching the field, whether the field is immediately present or represented symbolically (Witkin et al. 1962, p. 69). The extremes have been labeled analytical and global field approach. Field dependence is therefore a more general or global field approach whereas field independence is represented by an analytical field approach. In the case of WISC Picture Completion, Block Design, and Object Assembly Performance Subscores, they have their highest loading on Factor III, "the weighted scores for these three tests . . . constitute an intellectual index, paralleling the perceptual index" (Witkin et al. 1962, p. 70).

Therefore, there does not appear to be a significant relationship between intellectual ability and either field-dependence or field independence. Rather, the highest loading on Factor III tended to
reinforce the loading of Factors I and II, thus offering a plausible explanation for results from the Woerner & Levine (1950) study.

Other data have been reported that suggests the relationship between I.Q. and cognitive style may be statistically significant. Witkin et al. (1962) have maintained that there are significant differences between intelligence and cognitive style, although there is some overlap. In their first book, the relationship between intelligence and cognitive style did not appear to be extensively discussed with the exception of one study in which the EFT and the WISC were administered to children. The results indicate that for boys, verbal I.Q. correlated .54, performance .88, and full scale .71 with the perceptual test. For girls, correlations were for verbal .57, performance .77, and full scale .74.

The intelligence issue was dealt with more extensively by Witkin et al. (1962). They reported correlations between the Stanford-Binet Test and perceptual measures of .57 for boys and .76 for girls. Witkin et al. (1962) have stated that it is primarily these intelligence subtests that relate to cognitive style and are responsible for the correlations that are found between I.Q and perceptual measures. They emphasize that field-independent children are not intellectually brighter than field-dependent children, but that some WISC subtests indicate a difference between the two groups.

Gardner, Jackson, and Messick (1960) explored the relationship between cognitive principles and intellectual abilities. Their results support the findings of the Gardner, Holzman, Klein, Linton, and Spence
(1959) study indicating a multidimensional nature of cognition.

Intellectual abilities and cognitive controls are not isolated aspects of cognitive organization but are mutually interrelated. The arbitrary distinction that has sometimes been maintained between intelligence and the broad scale organization of cognition thus seems inappropriate (Gardner et al. 1960, p. 123).

Other studies designed to investigate the relationship between intelligence and the analytical-global cognitive style dimension indicate somewhat consistent results. Elliott (1961) reported that the EFT correlated .29 and .21 with quantitative and verbal sections of the School and College Ability Test. Spotts and Mackler (1967) found the EFT correlated .34 with the Otis I.Q. Test. Frederick (1968) and Bigelow (1971) have demonstrated similar results with populations of children. Dreyer et al. (1971) found no significant differences in the WISC results for analytic versus global children ages nine to sixteen.

Therefore, it appears that cognitive style and analytical measures on intelligence test do have a significant relationship. Intellectual abilities and cognitive controls do not appear to be isolated, rather they appear to be interrelated. In order to examine the relationship between cognitive style and intelligence as measured by the Wechsler Intelligence Scales (WAIS and WISC), picture completion, object assembly and block design subtests need to be compared to the results of perceptual tests, for example, the EFT.
Academic Evolution During the College Years

In a study designed to examine the role of cognitive styles in academic evolution during the college years, Witkin (1977) examined the following objectives: one, the influence of two seemingly unrelated cognitive domains—the field-dependent and field-independent cognitive domains and verbal comprehension skills in college students' academic standing through four years of college; two, the influence of patterns of students' standing in these cognitive domains upon the decision to go on to graduate school; three, to determine the extent to which academic choices made at the high school level, viewed from the standpoint of cognitive styles, are predictive of academic functioning in college and/or the orientation toward graduate school; four, to study the effect upon various aspects of college evolution of a marked discrepancy in level of functioning in the field-dependence-independence and verbal-comprehension domains and to seek the sources of these discrepancies during evolution; and five, to examine the role of the field-dependent and field-independent cognitive styles in the verbal functioning of students who appear no different in standard tests of verbal ability. The results of this study indicated that the field-dependence-independence dimension is only slightly related to verbal skills and appears to be unrelated to overall academic achievement. However, academic choices of and achievement in specific fields of study appear to be a function of
cognitive styles. The results were clearest in mathematics and the natural sciences. In accord with their cognitive style, field-independent students tended to choose domains that were impersonal, abstract and analytical, and tended to do better in math-science as evidenced by SAT-M scores, Regents exams, and course grades.

In contrast, field-dependent students tended to be found in education, and other nonscience fields which feature an interpersonal orientation. Some evidence existed to indicate that students with a field-dependent cognitive style may also do better in interpersonal fields of their choice, although the evidence did not appear to be conclusive.

Therefore, field-dependent and field-independent students choose domains that are compatible with their cognitive styles. Witkin et al. (1977) cautions that this finding does not provide a sufficient basis for using cognitive style measures for the purpose of academic guidance. Rather, says Witkin, measures of academic preference (preliminary major choice) and achievement (SAT-M) are already available at college entry, and perhaps are most appropriate. Witkin concludes this study by indicating that information about cognitive style might be appropriate and helpful to the student and to the institution when:

the complex process of self-selection and institutional selection that leads to greater compatibility between cognitive styles and choice of fields reach completion . . . if it continues through
the undergraduate and postgraduate years, then information about his/her cognitive style may be useful to the college student at points of academic choice (Witkin, 1977).

Pierson (1965) examined the relationship of cognitive style to measured vocational interests of college men. The hypothesis posited that individuals employ relatively stable strategies to perceive and to organize a wide array of information and activities in accord with their personality dispositions. The purpose of the study was to examine statistical relationships between two cognitive styles--field independence and "preference for structure" and seven vocational interest patterns measured by Strong's Vocational Interest Blank.

Pierson (1965) concluded that, with knowledge of S's cognitive style, it was possible to determine only to a limited extent the general kinds of vocational interests these S's hold. He was not able to predict specific interest patterns by cognitive styles. The results of this study indicated that individuals' strategies and cognitive modes organize their vocational interest patterns in ways consonant with their personality dispositions.

Another study was conducted by Clar (1971) to examine the relationship of psychological differentiation to client behavior in vocational choice counseling. A review of the literature suggested that certain qualities of self derived from an articulated, well-delineated self-concept are especially adaptive for the client involved in making a vocational choice. Further, it had been established that a clearly defined self-percept and sharp sense of
separate identity are characteristic of the individual whose level of psychological differentiation is high. Therefore, says Clar, the psychological differentiation construct thus appeared to epitomize and encompass many self qualities which are differentially adaptive in the context of vocational decision-making. Accordingly, the hypothesis of this study was that highly differentiated clients would function more adaptively than limitedly differentiated clients in four distinct areas of vocational choice behavior.

The results of the Clar (1971) study revealed only scant evidence to the effect that level of psychological differentiation relates positively to being actively independent or to being highly self-aware in the counseling setting. Clar concluded that only a limited portion of the variance of vocational choice behavior appears to be determined by cognitive style variables.

From studies designed to delineate the relationship between cognitive style and academic evolution during the college years, it appears that field-dependence-independence most closely correlated to certain academic choices of and achievement in specific areas of studies. Specifically, field-independent students chose academic domains that tended to be impersonal, abstract and analytical, for example, mathematics and the natural sciences. Field-dependent students tended to gravitate to domains that featured an interpersonal orientation, for example, education and social work.

The use of cognitive style in vocational interest patterns and specific vocational counseling does not appear to be efficacious in
that vocational interest patterns tended to cluster themselves around more general personality dispositions rather than around cognitive style.

The Teaching-Learning Process

Another area closely related to the above deals with cognitive style and the teaching-learning process. Witkin et al. (1974) stated that students with different cognitive styles respond differently to particular teaching approaches and to particular learning situations. Field-independent students tended to find solutions to problems more rapidly, operating from a more abstract and impersonal perspective. Their psychological defenses tended to be more specific than global, for example, intellectualization. Field dependent students tended to take longer to find solutions to problems. They tended to pay greater attention to their social field in defining attitudes and sentiments and tended to take into account the views of others. Their psychological defenses tended to be more global versus specific.

Field dependent students tended to be drawn to people, interested in them, stating that they liked being around them. They tended to favor "with people" occupations, for example, elementary education, sales, rehabilitation counseling. In school, they tended to prefer subjects that focused on people and interpersonal relationships. In addition, field dependent students were better able to pick-up on social cues, having a "sensitive radar system"
(Witkin et al. 1974 p. 5). They were attuned to the social components of their environments, alert to words that were social in meaning, attentive to the rate of speech and to the nuances of emotional expression that appeared to be different from their own. They tended to use social referents in defining their own point of view and feelings.

In contrast, field independent students tended to avoid others, appreciating more solitary situations and activities. Their "radar systems" did not appear to be as sensitive to social cues from their environment. They tended to select school subjects that were also more impersonal and abstract, for example, mathematics and physical science.

In a classroom situation, motivation appeared to be greater when a student believed that he/she was doing his/her own thing, that is, field independent students tended to be more highly motivated in classroom situations that are more impersonal in nature. What was attended to, learned and remembered in the classroom and in turn survived in memory was thought to be related to the material's salience and the individual's cognitive style.

Social reinforcement (praise and criticism) tended to have a greater impact on field-dependent individuals. Response contingent reinforcement (reinforcement administered directly after a response was made) appeared to have its greatest impact on field-dependent individuals.
Witkin et al. (1974) reported that the tendency for field-dependent individuals to use external referents was not limited to social behavior. Whatever the nature of the material, field-dependent individuals were likely to take the organization imposed from the source vs. imposing organization of their own. When the subject matter lacked organization or required individuals to impose their own, field-dependent individuals tended to experience difficulty.

Data from the Witkin et al. (1974) study dealing with hypothesis testing in concept attainment indicated that hypothesis formation was consistent with Bruner's notion (Bruner, Goodnow, and Austin, 1956) of focusing strategy or a strategy whereby each attribute of a hypothesis is systematically tested for relevance to the concept to be attained. Field-dependent individuals showed a pattern consistent with local consistency strategy (Gregg and Simon, 1967), that is, a strategy where a hypothesis is maintained until feedback indicates that it is incorrect. In addition to the above, field-dependent individuals functioned more effectively when more explicit directions in problem-solving strategies, and/or more explicit instructions in outcome performance were given.

A teacher's cognitive style in interaction with a student's cognitive style appears to be significant in the teaching-learning process. The greater social orientation of field-dependent teachers was reflected in a preference for teaching situations that allow for greater interaction with students. Field-dependent teachers tended to
prefer class discussions whereas field-independent teachers tended to prefer a lecture-discovery method. Field-dependent teachers tended to view field-dependent students more positively while field-independent teachers tended to view field-independent students more positively.

Thus, cognitive style appears to play a dominant role in the teaching-learning process. Field-independent students tended to: solve problems more rapidly; exhibit specific vs. global psychological defenses; engage in solitary vs. social situations and activities; select school subjects that were impersonal and abstract; be more highly motivated in classroom situations that were impersonal (lecture-discovery method); not be greatly influenced by social reinforcement, be better able to impose their own organization when the subject matter lacked structure; and be able to function without explicit directions in problem-solving strategies.

In contrast, field-dependent students tended to: take longer to solve problems; exhibit more global vs. specific psychological defenses; engage in social vs. solitary activities; be more highly motivated in classroom situations that were more personal and interactional; be influenced by social reinforcement and response-continguent reinforcement, be more sensitive to the organization imposed on a situation vs. imposing organization of their own; function more effectively when explicit directions in outcome performance were given; and be able to function more effectively in a more socially oriented classroom situation.
Personality Characteristics

The concept of cognitive style was enlarged by Witkin, Lewis, Hertzman, Machover, Meissner, and Wapner (1972) to include broad personality characteristics. Their thesis indicated that the more determinate the structure of a situation i.e., an individual is not required to provide his/her own unique attributes to the structure in order to obtain a determining response, the more dominant it is in determining the outcome. Conversely, the more ambiguous the structure of a situation, the greater opportunity there is for the individual to place his/her personal attributes onto the situation in order to determine an outcome. Witkin et al. (1972) have stated that in order to form a comprehensive estimate of the role of personal factors in perception it is especially important to explore the role of field factors in the situations used.

One of the outcomes of the Witkin et al. (1972) study indicated that people's perceptual performances vary greatly depending on the task with which they are required to deal. A common feature (Witkin et al. 1972) of the tasks involved in this study was that they required the separation of an item from its field. The results indicated that "perception is influenced in a basic—and probably primary—way by the nature of the field in which it takes place, and that differences in task structure make for important differences in perception" (Witkin et al. 1972).
Witkin et al. (1972) grouped their finding regarding personality characteristics into three categories: one, the nature of the individual's relation to his/her environment (including other people); two, the way in which an individual manages his/her impulses and strivings; and three, the kind of conception he/she has of him/herself. Regarding the first category of personality characteristics, field-dependent persons tended to exhibit one, passive attitudes and behaviors, signifying an inability to function independent of environment support, two, a reticence to initiate activity, and three, a readiness to submit to the forces of authority. Activity was viewed as reflective of field-independence. The ability to function with relatively little support from the environment, the capacity for initiating and organizing, and the ability to move beyond social and other environmental forces are reflective of activity.

Experimental results from the second category of personality characteristics dealing with the way an individual deals with his/her impulses and strivings indicated that the lack of awareness of inner life, fear of aggressive and sexual impulses and poor control over these impulses tended to be associated with field-dependence. Awareness of inner life, a tendency to accept the existence of hostile and sexual impulses, and a more-or-less effective discharge and control of these impulses were characteristic of the field-independent individual.

The third category of personality characteristics dealing with perception of self indicated that individuals who were field-dependent
tended toward a lower estimate of self (self esteem) whereas field-independent individuals tended to exhibit characteristics of a higher estimate of self (self esteem), and a greater degree of self-acceptance and confidence in their body.

Therefore, there appears to be significant differences between individuals' who tended to function from a field-dependent orientation vs. those who tended to function from a field-independent orientation. Those exhibiting a field-dependent orientation tended to need environmental support, not imposing themselves on their environment. They tended not to initiate activity and submitted themselves to the forces of authority when it was required of them. In addition, they were not able to integrate hostile and sexual impulses into their personality structure, nor discharge these impulses as readily as their field-independent counterparts. They also tended to have a lower estimate of themselves as compared with field-independent individuals'.

In contrast, field-independent individuals required little support from and were able to initiate and organize elements of their environment. They exhibited a greater ability to integrate their hostile and sexual impulses into their personality structure and were more effective in discharging them appropriately than their field-dependent counterparts. They also tended to have a higher level of self-esteem.

The topic of psychological differentiation and its relationship to college students has not been researched extensively. Several studies have been conducted dealing with the impact psychological
differentiation has on persons from different cultures, for example, Sinha (1983). Selected socioeconomic variables, for example, a friend's socioeconomic status, demographic backgrounds and their relationship to psychological differentiation have been studied by Filsinger (1979, 1980). Cognitive and personality dimensions such as future-time perspective (Durland, 1981); the predisposition to jealousy and the jealous state (Kristjen, 1982); hypnotic susceptibility (Wexler, 1982); inferencing and problem solving abilities (Cagley, 1983); computer assisted instruction (Vallante, 1983); student rating of faculty (Self, 1983); cognitive tempo dimension (Leitgeb, 1982); hemispheric specialization (Zoccolotti, Passafiume, & Pizzamiglio, 1979, Bloom 1980, Travis 1983); parental attitudes toward child-rearing (Self 1983); and biofeedback (Bourgeois, Levenson & Wagner 1980) have been examined to determine the relationship to field dependence-independence.

Tobacyk (1981) studied the relationship between personality differentiation, effectiveness of personality integration and mood in female college students via scores from the Rod-And-Frame Test, the Embedded Figures Test, the Ego Identity Incomplete Sentences Blank, and the Mood Assessment Instrument. Results indicated that greater personality differentiation was associated with less affective complexity; neither personality differentiation nor effectiveness of personality integration was significantly associated with mood level; and greater effectiveness of personality integration was associated with less mood variability.
Field dependence-independence and the differentiation of self and others was examined by Davies (1982). Forty-three college students rated themselves and familiar stimulus persons on a number of personality dimensions using a modified version of the Kelly Repertory Grid Procedure. Results indicated that field-independent subjects produced judgements reflecting greater self-other differentiation than field-dependent subjects, but there were no significant differences within-self, within others, or between other differences, suggesting a specific meaning for the concept of psychological differentiation in the interpersonal domain.

Two studies have been conducted on academic success and differential achievement. Loudin (1981) investigated the relationship between field dependence-independence and achievement differences between mathematics, English, social studies, and natural science. The Group Embedded Figures Test, ACT scores, high school grades and performance in classes were used to measure achievement. Each subject also ranked subject areas in order of preference. A significant relationship between ACT scores and grades in English and natural science was found. Subject area preference did not appear to be significantly related to field dependence-independence. Loudin concluded that while field dependence-independence may be related to performance on specific tasks, it is not related to differences in general achievement.

Wolfe (1982) investigated the relationship between sets of variables associated with individual differences, that is, cognitive
styles, affective or social traits, and measures of academic success. Measures included the California Personality Inventory, high school grade-point-average, SAT-M, SAT-V, and first semester grade point average. The results of this study do not appear to substantiate the alleged pervasive influence of cognitive style as demonstrated by Witkin.

Locus of control and field-dependence-independence have been thought by some to be comparable. The concept of locus of control emerged from Social Learning theory which attempts to understand human social behavior and the array of conditions that affect it. The major assumptions of Social Learning theory are as follows: 1, "the unit of investigation for the study of personality is the interaction of the individual and his meaningful environment" (Rotter 1954, p. 85); 2, the emphasis of the theory is on learned social behavior; 3, there is unity to personality; 4, social learning theory emphasizes both general and specific determinants of behavior and rejects the polarities inherent in the exclusive use of one or the other; 5, there is a purposeful quality to human behavior; and 6, "the occurrence of a behavior of a person is determined not only by the nature or importance or goals or reinforcements, but also by the person's anticipation or expectancy that these goals will occur" (Rotter, 1954, p. 102).

Witkin et al. (1962) speak of differentiation in terms that appear to overlap with the locus of control construct.

With respect to relations with the surrounding field, a high level of differentiation implies clear separation of what is identified
as external to the self. The self is experienced as having definite limits or boundaries. Segregation of the self helps make possible greater determination of functioning from within, as opposed to a more or less enforced reliance on external nurturance and support for maintenance typical of the relatively undifferentiated state (Witkin et al. 1962, p. 10).

Rotter (1966) did not find a relationship between locus of control measures (I-E scale) and the Gottschalk Figures Test (a measure of differentiation). Also, Chance and Goldstein (1971) did not find a significant relationship between the I-E Scale and results from the Embedded Figures Test. Results of the latter study improved from trial to trial as they progressed through the Embedded Figures Test. Positive relationships have been reported between these two measures by Massari (1975), and Crandall and Lacey (1972).

Since locus of control and differentiation measures have only occasionally been found to be related to one another, some investigators have attempted to use the variables conjointly, for example, Deever (1968), Lefcourt and Telegdi (1971). These investigators reported evidence that indicates that the constructs are similar in predicting assertiveness, the experiencing of oneself as a distinct source of causation, and a tendency to be self-reliant rather than acquiescent and conforming (Lefcourt, 1982).

Therefore, it appears that locus of control and psychological differentiation can be used conjointly to afford better predictions
than either variable might do alone.

Summary

From the above discussion, it appears that cognitive style has a consistent, long-term effect. Its impact appears to be observable in an individual's perceptual, intellectual, emotional, motivational, defensive, and social operations.

Specific areas of intelligence tests, that is, subtests that measure analytical ability appear to have a significant relationship with cognitive style. There appears to be an interrelation between intellectual abilities and cognitive controls. The Picture Completion, Block Design, and Object Assembly Subtests of the Wechsler Intelligence Scales appear to be positively correlated with Witkin's Embedded Figures Test of field-dependence vs. field-independence.

Field-dependence-independence appears to be closely correlated with certain academic choices of and achievement in specific areas of studies, that is, mathematics and the natural sciences. Students who exhibited a field-dependent orientation tended to gravitate toward domains that featured an interpersonal orientation, for example, education and social work, whereas students who exhibited a field-independent orientation tended to gravitate toward domains that featured an impersonal orientation, for example, mathematics and the natural sciences. The use of cognitive style in vocational interest patterns and specific vocational counseling does not appear to be
efficacious in that vocational interest patterns tended to cluster themselves around more general personality dispositions rather than around cognitive style.

An individual's cognitive style appears to have an impact on the teaching-learning process. Field-independent students appear to be more adept at problem-solving tasks and to be better able to impose their own organization onto a situation when the situation lacked structure than did their field-dependent counterparts. In addition, their cognitive orientation may influence their preference to engage in solitary situations and to prefer school subjects that tend to be impersonal and abstract. Lastly, they do not appear to be swayed by social reinforcement.

The field-dependent student appeared to be less adept at problem-solving tasks, and was more sensitive and consequently more dependent upon the social structure in finding solutions to tasks. They had greater difficulty imposing structure of their own onto a situation and functioned more effectively when explicit directions were presented with the problem-solving task. These students preferred social vs. solitary activities and were more highly motivated in classroom situations that were more personal and interactional. Social reinforcement and response contingent reinforcement had a greater effect on these students than on field-independent students.

It has also been demonstrated that there are significant differences between cognitive style and personality characteristics. Field-dependent individuals needed environmental support and did not
impose themselves on their environment nearly as much as their field-independent counterparts. They also appeared to be reticent to initiate activity and were more willing to submit themselves to the forces of authority. These individuals had greater difficulty integrating seemingly hostile elements, for example, unacceptable sexual impulses into their personalities. As a group, they tended to have a lower level of self-esteem than comparable group of field-independent individuals.

In contrast, field-independent individuals tended to require little support from their environments, were willing and able to initiate and organize activities, and were less willing to submit themselves to the forces of authority. They appeared to be better able to integrate the existence of hostile and sexual impulses into their personalities and to effectively discharge these impulses in appropriate channels without undue distress than were field-dependent individuals. They tended to have a higher level of self-esteem than their counterparts.
Chapter Three

Methodology

Introduction

This chapter presents the specific research methodology utilized in this study. It contains a description of the setting, the sample, procedures used and a description and discussion of the instruments. The research design and statistical analyses and summary are presented.

Setting

Data were collected from full-time undergraduate college students at a small, church related, midwestern, liberal arts college (enrollment, 1376 full-time students). Students who attended primarily came from eastern and midwestern sections of the United States.

Sample

One group of subjects who participated in this study were students in a college freshmen Contemporary Issues class (a two-semester ongoing orientation program) taught by faculty members from various departments.
and disciplines. As mentioned in the Limitation section of the first chapter, students were assigned to these classes as the college received their enrollment deposit. The course was offered from 2:00-3:00 in the afternoon on Monday and Wednesday. The educational level of the freshmen group consisted of a high school education and one semester of college. There were 25 males and 30 females.

The second group of subjects who participated were classified as second semester juniors (having completed more than 60 semester hours). They were selected randomly for the School of Arts and Humanities, Sciences, Business, and Education. The educational level of college juniors consists of a high school diploma and at least 60 semester hours of college courses. There were 25 males and 25 females.

**Procedure**

The following instruments were administered to all subjects: the Group Embedded Figures Test (scored as either field-dependent of field independent); the Draw-A-Person Test (scored as having either a sophisticated body concept or the lack of sophisticated body concept and rated for level of conceptual maturity); the California Psychological Inventory (scored for (1) as having either low social adjustment or high social adjustment, and (2) as being satisfied or not satisfied with his/her academic endeavors). Tests were administered to students in groups of 15 or less. Subjects were informed that their performance would not become part of their permanent record, would not
affect their academic standing, nor would their results be shared with members of the faculty or the administration.

Procedure for rating grade-point-average: Academic achievement was measured by college grade point averages. College cumulative averages of 2.50 or above were considered indicative of academic achievement.

Procedure for rating social adjustment: Social adjustment was rated by using the California Psychological Inventory; specifically using Factors I and II. Well-being (Wb), Responsibility (Re), Socialization (So), Self-control (Sc), Tolerance (To), Good Impression (Gi), Achievement via Conformance (Ac), Achievement via Independence (Ai), and Intellectual Efficiency (Ie) constitute Factor I. Dominance (Do), Capacity for Status (Cs), Sociability (Sy), Social Presence (Sp), and Self-Acceptance (Sa) constitute Factor II. Mean T scores on Factors I and II of 45 or greater were considered indicative of social adjustment. Mean T scores on Factors I and II of less than 45 were considered indicative of social adjustment.

Procedure for rating subjects' degree of perceived satisfaction with his/her academic endeavors: Subjects' perceived satisfaction with his/her academic endeavors was rated by use of the Intellectual Efficiency (Ie) scale of the California Psychological Inventory. A T-score of 45 or greater was indicative of subjects' perceived satisfaction with his/her academic endeavors. A T-score of less than 45 was not indicative of subjects' perceived satisfaction with his/her academic endeavors.
Procedure for rating subjects' degree of psychological differentiation: Subjects' degree of psychological differentiation (field dependence versus field independence) was rated by use of the Group Embedded Figures Test. Subjects needed to trace all lines of the Simple Form (including the inner lines for the cube, Simple Form "E" and all incorrect lines must be erased. If these criteria had been met, one point was given. A total score of 12-18 indicated that the subject was field independent. A total score of 0-11 indicates that the subject was field dependent.

Procedure for rating subjects' degree of sophistication of body concept: Subjects' degree of sophistication of body concept was rated by using the "Sophistication of Body Concept Scale Rating" applied to the Draw-a-Person Test. A scale rating of 1 or 2 indicated that subjects' had a sophisticated body concept. A scale rating of 3, 4, or 5 indicated that subjects' had a sophisticated body concept.

Procedure for rating subjects' level of conceptual maturity: Subjects' level of conceptual maturity was rated by using the Harris rating system of the Draw-a-Person Test. A T-score between 85-115 was considered to be an average level of conceptual maturity. A T-score above 115 was considered to be an above average level of conceptual maturity. A T-score of less than 85 was considered to be a below average level of conceptual maturity.
Selection of Instruments

The Group Embedded Figures Test is a perceptual test. Subjects are requested to trace a previously seen simple figure within a larger more complex figure that has been organized to obscure or embed the simple figure. Therefore, scores reflect subjects' specific ability to disembed perceptually and more generally their ability to relate to more than differences in perceptual functioning.

Test Development: The Group Embedded Figures Test was designed to provide an adaptation of the originally administered Embedded Figures Test which made possible group testing. With the Group Embedded Figures Test, scores may be obtained in a single 20-minute testing session. The test contains eighteen complex figures, seventeen of which have been taken from the Embedded Figures Test. The subject is prevented from seeing simultaneously the simple form and the complex figure containing it. This was accomplished by printing the simple forms on the back cover of the Group Embedded Figures Test booklet and the complex figures on the booklet pages so that both simple and complex figures cannot be exposed simultaneously. The Group Embedded Figures Test contains three sections: the first section which contains seven very simple items and is primarily for practice; the second and third sections, each of which contains nine more difficult items.
The items selected for the Group Embedded Figures Test were based on an item analysis which included the following steps (Witkin, Oltman, Raskin, & Karp, 1971, p. 26-27):

1. Thirty-two items were prepared, 24 of which came from the original full-length Embedded Figures Test and eight of which were other Gottschaldt figures. Light shading was used to replace colored sections in the original Embedded Figures designs and was added to parts of the Gottschaldt figures. The 32 items were arranged in two parallel forms of 16 items each. In each form, four different item orders were used to keep roughly constant the number of subjects attempting each item. Half of the subjects (Male N = 168, Female N = 169) were given Form I and half Form II. Approximately half the subjects were given three additional tests: the standard Rod and Frame Test, a portable Rod and Frame Test, and an individual Embedded Figures Test consisting of those items not included in the Group Embedded Figures Test form which they had taken.

2. Correlations coefficients were obtained for each of the 16 items of each form against: a) total score of the form, b) scores on the standard Rod and Frame Test and portable Rod and Frame Test.

3. On the basis of these items-analyses, 20 items from the preliminary set of 32 were selected with yielded positive correlations with all three of the criterion measures. These 20 items were then given as a
single composite form to another population of undergraduates. Varying
time limits were tried out in order to determine the one which would
yield maximum discrimination of test scores.

Minor changes in the composite form were made in preparing the
final form of the test. One item was discarded because it presented
serious scoring difficulties. Two items were deleted, one of which was
replaced with another item from the original pool of items, in order to
obtain a better distribution of item difficulty.

The 18 items remaining were divided into two equivalent forms to
permit estimation of reliability coefficients. These forms are matched
as closely as possible for item difficulty, discriminative indices and
the frequency with which the different Simple Forms are present in the
complex Figures. Within each form, the items are in an ascending order
of difficulty.

The time limit of five minutes for the Second and Third sections
was set on the basis of pretesting which indicated that, for their
college samples, this time limit permitted a portion of subjects to
attempt every item and also yielded a normal-appearing frequency
distribution with a wide range of test scores.

Scoring: The score is the total number of simple forms correctly
traced in Second and Third Sections combined. Omitted items are scored
as incorrect. The items in the First Section are not included in the
total score. Scorers should, however, scan this section before
starting to score the booklet as a means of making sure that the
subjects have understood the test directions.
A scoring key is provided with the Simple Form traced over each Complex Figure. In order to receive credit for an item, all lines of the Simple Form must be traced (including the inner lines for the cube, Simple Form "E"). The Scorer must also be sure that no extra lines have been added by the subject and that all incorrect lines have been erased.

Norms and Reliability: Witkin, Oltman, Raskin, & Karp (1971) reported that norms available are based on men and women college students from an eastern liberal arts college (see Table 1). Women did slightly but significantly worse than men (p < .005). This difference appears to be consistent with data obtained from the Embedded Figures Test.
Table 1

Number Correct: Group Embedded Figures Test

<table>
<thead>
<tr>
<th>Quartiles</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0-9</td>
<td>0-8</td>
</tr>
<tr>
<td>2</td>
<td>10-12</td>
<td>9-11</td>
</tr>
<tr>
<td>3</td>
<td>13-15</td>
<td>12-14</td>
</tr>
<tr>
<td>4</td>
<td>16-18</td>
<td>15-18</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>155</td>
<td>242</td>
</tr>
<tr>
<td>Mean</td>
<td>12.0</td>
<td>10.8</td>
</tr>
<tr>
<td>S.D.</td>
<td>4.1</td>
<td>4.2</td>
</tr>
</tbody>
</table>

"These norms are strictly applicable only to individuals coming from populations similar to the group from which the norms were obtained. For other populations, they can serve only as a general guide (Witkin, Oltman, Raskin, & Karp, 1971)."

A correlation between parallel forms of the Group Embedded Figures Test with identical time limits has been used as an estimate of reliability. Correlations between the nine-item First Section scores and the nine-item Second Section scores were computed and corrected by the Spearman-Brown prophecy formula, producing a reliability estimate of .82 for both males (N=80) and females (N=97).
Validity: As a means of assessing validity, Witkin, Oltman, Raskin, & Karp (1971) results from sections of the Group Embedded Figures Test were compared with results from sections of the Embedded Figures Test. The correlations, corrected for reduced test length and combined for the two groups, are reported in Table 2.

As a second measure for evaluating the Group Embedded Figures Test's validity, the Rod and Frame Test was used. Subjects were administered the Group Embedded Figures Test and subsequently administered the portable Rod and Frame Test (PRFT). Subjects' scores on the latter test were the absolute size of the errors summed over eight trials.

A final measure used by Witkin, Oltman, Raskin & Karp (1971) was the degree of articulation of body concept which is assessed by means
Table 2

Validity Coefficients

<table>
<thead>
<tr>
<th>Population</th>
<th>N</th>
<th>Criterion Variable</th>
<th>r with GEFT Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>male undergraduates</td>
<td>73</td>
<td>individual EFT, solution time</td>
<td>-.82</td>
</tr>
<tr>
<td>female undergraduates</td>
<td>68</td>
<td>individual EFT, solution time</td>
<td>-.63</td>
</tr>
<tr>
<td>male undergraduates</td>
<td>55</td>
<td>PRFT error</td>
<td>-.39</td>
</tr>
<tr>
<td>female undergraduates</td>
<td>68</td>
<td>PRFT error</td>
<td>-.34</td>
</tr>
<tr>
<td>male undergraduates</td>
<td>55</td>
<td>ABC degree of body articulation</td>
<td>.71</td>
</tr>
<tr>
<td>female undergraduates</td>
<td>68</td>
<td>ABC degree of body articulation</td>
<td>.55</td>
</tr>
</tbody>
</table>
of a scale (ABC) applied to human figure drawings (Faterson & Witkin, 1970). Subjects were asked to take the Group Embedded Figures Test, the portable Rod and Frame Test and asked to make human figure drawings. These drawings were rated on the ABC scale, with the most articulated drawings receiving a score of 5 and the least articulated a score of 1.

The correlations between the Group Embedded Figures Test and the Embedded Figures Test are reasonable high, especially for men. Correlations between the Group Embedded Figures Test and the Portable Rod and Frame Test are somewhat lower than the range of correlations found between the Embedded Figures Test and the Rod and Frame Test. The correlations between the Group Embedded Figures Test and the articulation of body concept were significant, especially for male subjects.

Based on evidence presented, the Group Embedded Figures Test may provide a useful substitute for the Embedded Figures Test, when individual testing is impractical.

Draw-a-Person Test—Sophistication of Body Concept Scale: Karen Machover (1949) developed a special scale for rating the nature of body concept from the Draw-A-Person Test. It consists of a variety of specific items based on graphic features. This scale includes a cluster of items referring directly to the body concept (the "lack of body esteem" cluster); it also included clusters bearing in other areas (uncontrolled or primitive expression of anxiety, lack of
self-assurance, lack of struggle for sexual identification, and lack of drive or drive modification).

The first step in formulating the "sophistication of body concept scale" was to group together sets of drawings of different levels of sophistication on the basis of overall global impression. The drawings were examined to determine specific graphic features that provided the basis for global impressions of degree of primitivity or sophistication. What resulted was three categories of characteristics: one, form level of the drawings; two, the extent of identity and sex differentiation of the figures; and three, the level of detailing (see Table 3) (Witkin, Dyk, Paterson, Goodenough, & Karp, 1962).
Table 3

Characteristics of Drawings Reflecting Level of Sophistication

A. Form level

1. Primitive features
   a. Circles or ovals for body and limbs
   b. Triangular or rectangular body with limbs stuck on
   c. Other forms lacking attempt at human shape (e.g., absence of waist, shoulders, etc.)
   d. Limbs in form of sticks or ovals, shapeless, ending in pronglike of clawlike fingers; no shaping of hands; pronglike or clawlike toes
   e. Contact point of limbs to trunk involving overlapping or transparent joining; limbs stuck on or detached (as opposed to integrating body parts)
   f. Grossly unequally sized arms, legs, ears, fingers, etc., combined with primitive form, uncontrolled lines
   g. Indiscriminately attached or misplaced body parts (e.g., arms attached at center of trunk)

2. Sophisticated features
   a. Definite, shaped body outline; head, neck, shoulders well integrated into body outline and lead into trunk and appendages
   b. Attempt at human-like shape, proportioning
   c. Adequate profiling (e.g., trunk and legs facing in same direction,

B. Identity and sex differentiation

1. Primitive features
   a. Objectively interchangeable male and female figures
   b. Difference between figures only in hair and/or hat treatment
   c. Minimal inadequate trunk differentiation (i.e., triangle trunk for female, oval for male, but otherwise identical; or belt for male and buttons for female as only difference)
Table 3 (continued)

2. Sophisticated features—marked and adequate role assignment, expressed in clothing and/or shape (also expressed in hair, features, appropriate accessories, uniforms, etc.)

C. Level of detailing

1. Primitive features
   a. Body parts omitted (e.g., absence of neck, nose, ears, or eyebrows; fingers attached directly to arms with hands omitted)
   b. No clothing indicated
   c. Facial features expressed by dots or ovals
   d. Inadequate or inconsistent clothing (e.g., buttons but no neckline, cuffs, or hemline; hat, but no other clothing; toes shown in otherwise clothed figure; tie, but no neckline, etc.)

2. Sophisticated features
   a. Consistent, well-rationalized detailing; clothing; facial expression; shoes
   b. Figure cast in role with good attempt at presentation of action
   c. Figure cast in role with presentation of accessories consistent with this role (e.g., cowboy with smoking gun, etc.)
A five-point rating scale was formulated based on detailed definitions of these characteristics. A single rating based on drawings was assigned to each subject (see Table 4).

For purposes of cross-validation, a sophistication scale was applied to the drawings of 30 boys both by the original rater and by a second independent judge. A correlation of .84 (p < .01) between ratings of the two judges suggests satisfactory interjudge reliability. A study with 16 college men provides evidence on the communicability, scoring reliability, and validity of the scale. Sixteen sets of drawings were scored by four independent psychiatrists with interjudge correlations of .83 and .92.

When comparing the "sophistication-of-body concept scale" ratings to the Goodenough point scores, they correlated .74 (p < .01). Therefore, it appears that this scale addresses itself to similar aspects of the figure drawings.
Table 4

Sophistication of Body Concept Scale Rating

1. Most sophisticated drawing: These manifest high form level (e.g., waistline, hips, shoulders, chest, or breasts, shaped or clothed limbs, etc.); appendages and details represented in proper relation to body outline, with some sophistication in mode of presentation; appropriate, even imaginative, detailing (e.g., successful profiling, as young girl in evening clothes, well-dressed man with cigarettes etc.)

2. Moderately sophisticated drawings: Drawings which show a definite attempt at role assignment (with regard to age, activity, occupation, etc.) through adequate detailing, shaping clothing with continuity of outline (i.e., integration of parts) attempted.

3. Drawings intermediate in level of sophistication: Drawings in which identification of sex is evident, attempts at shaping and a fair level of integration of parts are manifest and a minimum of detailing is present.

4. Moderately primitive drawings: Drawings which essentially still lack features of differentiation through form, identity, or detailing; however these drawings show slightly more complexity in some respect (e.g., presence of one body part that is unusual in most primitive drawings, such as the neck).

5. Most primitive and infantile drawings: These manifest a very low level of form (ovals, rectangles, sticks stuck on to each other); no evidence of role or sex identity (same treatment of male and female with, at most, difference in hair treatment, no facial expression, little shaping or clothing.)
The Draw-a-Person Test—Harris Goodenough Scoring System: The Draw-a-Person Test will also be rated using the Goodenough scoring system (Harris, 1963). The male drawing is evaluated via a 73 point scale while the female drawing is rated via a comparable 71 point scale. The total number of points earned by a subject is converted to a standard score based on conversion tables developed by Harris (1963). Separate tables are provided for males and females for the Man and Woman Scales. Standard scores from the Man and Woman Scales are average directly to obtain an average measure on the Man and Woman drawings. This is accomplished by summing the two standard scores and dividing by two. Harris (1963) stated that the result provides a more reliable estimate of a subject's conceptual maturity than his/her score on either test alone. The standard scores have a mean of 100 and a standard deviation of 15.

California Psychological Inventory: The California Psychological Inventory (CPI) was first published in 1948 by Harrison Gough. In 1957, Consulting Psychologists Press published the full eighteen-scale California Psychological Inventory. Anastasi (1968, p. 448) hails it as "one of the best personality inventories currently available—its technical development is of a high order, and it has been subjected to extensive research and continuous improvement." The California Psychological Inventory has been dubbed by Thorndike (1959) as the "sane man's Minnesota Multiphasic Psychological Inventory," implying that the California Psychological Inventory is a collection of eighteen
scales designed for use in normal populations.

The California Psychological Inventory is a self-administered, paper and pencil personality test designed for group administration. Megargee (1977) stated that standardized testing are not essential, and no time limit is imposed. Most subjects complete the inventory in sixty minutes. The test requires a fourth grade reading level and can be administered to subjects ranging in age from 12-70 years. There are 468 statements, 12 of which appear twice for a total of 480 items. Most of the content consists of reports of typical behavior patterns and customary feelings, opinions, and attitudes about social, ethical, and family matters.

Compared with the Minnesota Multiphasic Personality Inventory, the California Psychological Inventory is noted for its lack of symptom oriented material. By and large, the content is much less objectionable than that of the Minnesota Multiphasic Personality Inventory (Megargee, 1977).

Subjects respond to questions on a separate answer sheet whether he/she thinks each statement is true or false of him/her or whether he/she agrees or disagrees with it by placing an X in a box labeled true or false.

Raw Scores are transferred and plotted onto a profile sheet, thus converting the raw scores into T-scores. Standard scores have a mean of 50 and a standard deviation of 10. Standard scores were based on norms collected from 6000 men and 7000 women, although the sample was not a true random or stratified one.
The California Psychological Inventory is typically scored for 18 scales that Gough divided in four groups to aid in interpretation. Class I scales measure poise, ascendancy, self-assurance and interpersonal adequacy. Scales included are Dominance (Do), Capacity for Status (Cs), Sociability (Sy), Social Presence (Sp), Self-acceptance (Sa), and a Sense of Well-being (Wb). Class II scales measure assess socialization, maturity, responsibility, and intra-personal structuring of values. Included are six scales: Responsibility (Re); Socialization (So); Self-control (Sc); Tolerance (To); Good impression (Gi); and Communality (Cm). Class III scales group together three indices relating to academic potential and intellectual efficiency: Achievement via conformance (Ac); Achievement via independence (Ai); and Intellectual Efficiency (Ie). Class IV scales measure intellectual and interest modes. The three scales included are: Psychological mindedness (Py); Flexibility (Fx); and Femininity (Fe).

Of the 18 scales, 15 are designed as measures of various personality traits, while Well-being (Wb), Good impression (Gi), and Communality (Cm) serve as validity scales which also have interpretative significance.

The four classes are grouped to facilitate clinical interpretation of the profile rather than being grouped in psychometric factors or clusters. However, Class I and Class II do roughly correspond to the first and second factors that emerge from a factor analysis of the California Psychological Inventory. Such analyses yield five factors.
Factor two consists of scales Do, Cs, Sy, Sp, and Sa; Factor one is usually the largest and includes Wb, Re, So, Sc, To, Gi, Ac, Ai, Ie, and Py. However, says Magargee (1977) a number of these scales also have high loading on other factors as well. Factor three is considerably smaller than the first two, and is identified by scales To, Ai, Ie, Py, and Fx. Factor four consists of So and Cm. Factor five consists of a single scale, Fe.

Gough used multiple regression techniques to derive weighted combinations of the California Psychological Inventory that can assess such diverse factors as social maturity, achievement in medical school, and success on parole. Many predictions equations include the California Psychological Inventory and data from other tests of case histories.

Gough (1965) used different techniques for the derivation of various scales. He used both empirical and rational techniques, and selected his external criterion groups by a variety of methods. As a result, the California Psychological Inventory is a heterogeneous instrument. Gough's primary concern was the prediction of behavior. In test construction, he stressed convergent validity. As a result, the California Psychological Inventory has been criticized for redundancy, and high correlations with measures of response set (Magargee, 1977, p. 31).
Most of the scales were derived and cross-validated using large samples of high school and college students. Norms are available on a variety of groups (Gough, 1969). The California Psychological Inventory appears to be most applicable to students and young adults. There are more items dealing with studying and dating than with working or raising a family.

The determination of reliability was conducted using long and short-term test-retest correlations. Table 5 lists short-term test-retest correlations noted by Gough in the CPI manual along with short-term coefficients for eleven California Psychological Scales investigated by Hase and Goldberg (1967). The short-term coefficients reported by Hase and Goldberg (1967) range from .71 to .90 with a median of .83. Long-term coefficients are primarily in the .60s and .70s, indicating moderate stability over one year.

Magargee (1977) has calculated estimates of internal consistency by applying Kuder-Richardson Formula 21 to the means and standard deviations for the largest normative groups presented in Gough's CPI Manual. The coefficients range from .22 to .94 using 3572 high school boys and 4056 high school girls. Hase and Goldberg (1967) reported coefficients of internal consistency calculated by applying Kuder-Richardson Formula 20 to the responses of 179 University of Oregon freshmen women and to eleven of the eighteen California Psychological Inventory scales. In addition, Gough has supplied corrected and uncorrected split-half correlations for 550 men and women (see Table 6).
Table 5

Coefficients of Stability: California Psychological Inventory

<table>
<thead>
<tr>
<th>Scale</th>
<th>short term (1-4 weeks)</th>
<th>Long Term (1 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200 prisoners / freshmen</td>
<td>179 women</td>
</tr>
<tr>
<td>Do</td>
<td>.80</td>
<td>.89</td>
</tr>
<tr>
<td>Cs</td>
<td>.80</td>
<td>.79</td>
</tr>
<tr>
<td>Sy</td>
<td>.84</td>
<td>.90</td>
</tr>
<tr>
<td>Sp</td>
<td>.80</td>
<td>--</td>
</tr>
<tr>
<td>Sa</td>
<td>.71</td>
<td>--</td>
</tr>
<tr>
<td>Wb</td>
<td>.75</td>
<td>--</td>
</tr>
<tr>
<td>Re</td>
<td>.85</td>
<td>.83</td>
</tr>
<tr>
<td>So</td>
<td>.80</td>
<td>.88</td>
</tr>
<tr>
<td>Sc</td>
<td>.86</td>
<td>--</td>
</tr>
<tr>
<td>To</td>
<td>.87</td>
<td>.88</td>
</tr>
<tr>
<td>Gi</td>
<td>.81</td>
<td>--</td>
</tr>
<tr>
<td>Cm</td>
<td>.58</td>
<td>--</td>
</tr>
<tr>
<td>Ac</td>
<td>.79</td>
<td>.81</td>
</tr>
<tr>
<td>Ai</td>
<td>.71</td>
<td>.81</td>
</tr>
<tr>
<td>Ie</td>
<td>.80</td>
<td>.85</td>
</tr>
<tr>
<td>Py</td>
<td>.53</td>
<td>.74</td>
</tr>
<tr>
<td>Fx</td>
<td>.49</td>
<td>--</td>
</tr>
<tr>
<td>Fe</td>
<td>.73</td>
<td>.71</td>
</tr>
</tbody>
</table>
Table 6

Internal consistency coefficients: California Psychological Inventory

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Do</td>
<td>.70</td>
<td>.71</td>
<td>.80</td>
<td>.67</td>
<td>.80</td>
<td></td>
</tr>
<tr>
<td>Cs</td>
<td>.61</td>
<td>.68</td>
<td>.59</td>
<td>.65</td>
<td>.79</td>
<td></td>
</tr>
<tr>
<td>Sy</td>
<td>.74</td>
<td>.75</td>
<td>.80</td>
<td>.63</td>
<td>.77</td>
<td></td>
</tr>
<tr>
<td>Sp</td>
<td>.74</td>
<td>.75</td>
<td>--</td>
<td>.61</td>
<td>.76</td>
<td></td>
</tr>
<tr>
<td>Sa</td>
<td>.51</td>
<td>.58</td>
<td>--</td>
<td>.54</td>
<td>.70</td>
<td></td>
</tr>
<tr>
<td>Wb</td>
<td>.76</td>
<td>.79</td>
<td>--</td>
<td>.75</td>
<td>.86</td>
<td></td>
</tr>
<tr>
<td>Re</td>
<td>.72</td>
<td>.70</td>
<td>.67</td>
<td>.70</td>
<td>.82</td>
<td></td>
</tr>
<tr>
<td>So</td>
<td>.68</td>
<td>.67</td>
<td>.78</td>
<td>.72</td>
<td>.83</td>
<td></td>
</tr>
<tr>
<td>Sc</td>
<td>.82</td>
<td>.85</td>
<td>--</td>
<td>.77</td>
<td>.87</td>
<td></td>
</tr>
<tr>
<td>To</td>
<td>.74</td>
<td>.75</td>
<td>.74</td>
<td>.75</td>
<td>.86</td>
<td></td>
</tr>
<tr>
<td>Gi</td>
<td>.77</td>
<td>.77</td>
<td>--</td>
<td>.65</td>
<td>.79</td>
<td></td>
</tr>
<tr>
<td>Cm</td>
<td>.70</td>
<td>.52</td>
<td>--</td>
<td>.46</td>
<td>.63</td>
<td></td>
</tr>
<tr>
<td>Ac</td>
<td>.69</td>
<td>.94</td>
<td>.65</td>
<td>.65</td>
<td>.79</td>
<td></td>
</tr>
<tr>
<td>Al</td>
<td>.54</td>
<td>.56</td>
<td>.63</td>
<td>.62</td>
<td>.75</td>
<td></td>
</tr>
<tr>
<td>Ie</td>
<td>.81</td>
<td>.74</td>
<td>.72</td>
<td>.68</td>
<td>.81</td>
<td></td>
</tr>
<tr>
<td>Py</td>
<td>.22</td>
<td>.23</td>
<td>.44</td>
<td>.45</td>
<td>.62</td>
<td></td>
</tr>
<tr>
<td>Fx</td>
<td>.56</td>
<td>.51</td>
<td>--</td>
<td>.55</td>
<td>.71</td>
<td></td>
</tr>
<tr>
<td>Fe</td>
<td>.62</td>
<td>.29</td>
<td>.30</td>
<td>.57</td>
<td>.73</td>
<td></td>
</tr>
</tbody>
</table>
Personal and Social Factors: Several investigators have reported patterns on the California Psychological Inventory associated with maladjustment. This is accomplished by contrasting a California Psychological Inventory Profile with normal group profiles. The mean differences on the eighteen scales are then determined and tested for significance. Goodstein, Crites, Heilbrun & Rempel (1961) reviewed CPI protocols of men and women who had sought assistance for personal adjustment or vocational-educational problems from a university counseling service. Their scores were compared with those who had not sought assistance from a university counseling service. Non-clients possessed higher mean scores on personal adjustment, whereas clients who sought assistance for personal adjustment possessed the lowest. CPI protocol mean scores of men and women who sought assistance for vocational-educational matters fell between non-clients and clients who sought assistance for personal adjustment. The differences were statistically significant. The progression from non-clients to vocational-education clients was not found on factors 3, 4, and 5; only on factors 1 and 2. Factors 3, 4, and 5 are less directly related to personal or social adjustment.

McCloud (1969) also compared clients who sought assistance for personal adjustment concerns with those who sought assistance for vocational-educational concerns and with non-clients. He also found that personal adjustment clients were lower on a number of CPI scales.
The results of these studies indicate that personal and social maladjustment, as defined by various global criteria, are reflected in the CPI by decreased scores on the factor 1 and factor 2 scales.

**Intellectual Efficiency**: The Ie scale consists of fifty-two items, of which nineteen are keyed true and thirty-three false. The manifest content reflects an interest and enjoyment in intellectual pursuits. Examples are as follows: "I like to read about history" (T); "I seem to be as capable and smart as most others around me" (T). The high scorer indicates that he/she is free from physical complaints and ailments: "I seldom worry about my health (T); "I've had more than my share of things to worry about" (F). High scorers get along well with others without being overly suspicious, hostile or sensitive: "I am quite often not in on the gossip and talk of the group I belong to" (F).

Data concerning convergent validity stems from several sources, including correlations with conventional intelligence tests, studies of its relation to achievement in various academic settings, investigations of its relation to creativity, and studies of its construct validity i.e., Gough (1969), Aiken (1963), Martinson (1961), Purkey (1966), Bendig & Klugh (1956), MacKinnon (1962, 1964), Dicken (1963).

Overall, it appears that the intellectual efficiency scale correlates significantly with conventional tests of verbal intelligence, and is useful as a predictor of achievement and creativity.
Research Design

The research design for this study consisted of: (1), a 2 X 2 between groups design for freshmen males, freshmen females, junior males and junior females and for measures of field dependence-independence; (2), a 2 X 2 between groups design for freshmen males, freshmen females, junior males and junior females, for measures of field dependence-independence and for measures of academic adjustment, social adjustment, perceived satisfaction with one's academic endeavors, sophistication of body concept and conceptual maturity.

The research design included two treatment groups divided by sex: college freshmen males, college freshmen females, college junior males and college junior females. Each group was rated on (1) degree of field dependence-independence as measured by the Group Embedded Figures Test, (2) college grade point average, (3) estimates of sophistication of body concept and conceptual maturity taken from the Draw-A-Person Test, and (4) measures of personal and social adjustment and perceived satisfaction with one's academic endeavors taken from the California Psychological Inventory.

Statistical Analysis

The data collected in this study was analyzed in the following manner. One, the 2 X 2 between groups design for freshmen males, freshmen females, junior males and junior females was analyzed via a 2
X 2 Analysis of Variance (ANOVA) procedure with field dependence-independence used as a dependent variable. Two, the 2 X 2 between groups design for freshmen males, freshmen females, junior males and junior females, was analyzed via a 2 X 2 Analysis of Covariance (ANCOVA) with field dependence used as a covariate and academic achievement, social adjustment, perceived satisfaction, sophistication of body concept and level of conceptual maturity used as dependent variables.

Summary

This chapter presented the specific research methodology used in this study. The setting where data was collected was a small, midwestern, liberal arts, church-related college with an enrollment of 1276 full-time students. Subject pools were drawn from freshmen enrolled in an ongoing orientation class and from juniors, chosen at random. The Group Embedded Figures Test, California Psychological Inventory, grade-point average, and the Draw-a-Person Test were used to assess subjects. Subjects were rated: (1), for the degree of field dependence-independence on the Group Embedded Figures Test; (2), by their college grade point averages; (3), on their levels of social adjustment and perceived satisfaction using the California Psychological Inventory; and (4), on the sophistication of body concept and level of conceptual maturity using the Draw-a-Person Test. Descriptions and discussions of the testing instruments were given.
The dependent measures for this study were measures of students' academic and social adjustment, perceived satisfaction with their college program, and their levels of sophistication of body concept and conceptual maturity. Data were analyzed by a 2 X 2 Analysis of Variance (ANOVA) and by five Analyses of Covariance (ANCOVA).
Chapter Four

Results

Introduction

This chapter presents the results of the statistical analyses addressing the research questions posed in Chapter One. It is divided into four major sections. Section one presents an overview of the purpose, research design and method of statistical analyses. Section two presents the demographic data gathered on the sample population. Section three addresses the primary research questions through presentation of the results of statistical analyses conducted on the data obtained from this sample. Section four briefly summarizes this chapter.

Overview of Purpose, Research Design, and Method of Statistical Analyses

The purpose of this study was to determine whether differences exist in the cognitive/personal style of college students as it interacts with academic achievement, social adjustment, perceived satisfaction with subjects' academic endeavors, sophistication of
body concept and level of conceptual maturity. Do these factors provide for success or failure in college? Are there significant changes in these measures between the freshmen and junior years?

The research design for this study consisted of: (1), a 2 X 2 between groups design for freshmen males, freshmen females, junior males and junior females and for measures of field dependence-independence; (2), a 2 X 2 between groups design for freshmen males, freshmen females, junior males and junior females, for measures of field dependence-independence and for measures of academic adjustment, social adjustment, perceived satisfaction with one's academic endeavors, sophistication of body concept and conceptual maturity.

The research design included two treatment groups divided by sex: college freshmen males, college freshmen females, college junior males and college junior females. Each group was rated on (1) degree of field dependence-independence as measured by the Group Embedded Figures Test, (2) college grade point average, (3) estimates of sophistication of body concept and conceptual maturity taken from the Draw-A-Person Test, and (4) measures of personal and social adjustment and perceived satisfaction with one's academic endeavors taken from the California Personality Inventory.

The data collected in this study was analyzed in the following manner. One, the 2 X 2 between groups design for freshmen males, freshmen females, junior males and junior females was analyzed via a 2 X 2 Analysis of Variance (ANOVA) procedure with field
dependence-independence used as a dependent variable. Two, the 2 X 2 between groups design for freshmen males, freshmen females, junior males and junior females, was analyzed via a 2 X 2 Analysis of Covariance (ANCOVA) with field dependence used as a covariate and academic achievement, social adjustment, perceived satisfaction, sophistication of body concept and level of conceptual maturity used as dependent variables.

Demographic Data

Data were collected from 106 undergraduate students at a small midwestern, liberal arts, church-related college. Males comprised 50 (47.2 percent) of the subjects, females comprised 56 (51.9 percent) of the subjects. There were 55 freshmen (51.9 percent) and 51 juniors (48.1 percent). The mean age of the total group was 20 years, six months. The mean age of freshmen males was 19 years, five months, and the mean age for freshmen females was 19 years, three months. The mean age for junior males was 24 years, zero months and the mean age for junior females was 25 years zero months (see Table 7). All subjects were enrolled as full-time students (12 or more semester hours).
Table 7

<table>
<thead>
<tr>
<th>Group</th>
<th>Range</th>
<th>Median</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshmen males</td>
<td>18-09—20-08</td>
<td>19-06</td>
<td>19-4.6</td>
</tr>
<tr>
<td>Freshmen females</td>
<td>18-08—20-08</td>
<td>19-05</td>
<td>19-3.3</td>
</tr>
<tr>
<td>Junior males</td>
<td>19-10—41-04</td>
<td>21-10</td>
<td>24-0.0</td>
</tr>
<tr>
<td>Junior females</td>
<td>19-02—50-03</td>
<td>21-02</td>
<td>25-0.0</td>
</tr>
<tr>
<td>Total group</td>
<td>18-08—50-03</td>
<td>20-05</td>
<td>20-6.3</td>
</tr>
</tbody>
</table>
Primary Research Questions

What follows is a response to research question #1, which explored any differences that existed among group means of field dependence-independence among college freshmen males, college freshmen females, college junior males, and college junior females. The group mean for freshmen males was 8.88, and 9.90 for freshmen females. The group mean for both freshmen males and freshmen females indicated that they scored within the mildly field-dependent range. The group mean for junior males was 12.60 and 9.80 for females (see Table 8). The group mean for junior males indicated that they scored within the mildly field-independent range, whereas junior females remained within the mildly field dependent range. An obtained $F = .759$ ($p < .05$) indicated that statistical significance existed for class, but not for sex. An obtained $F = 2.991$ ($p < .05$) indicated that statistical significance existed in the interaction of class and sex (see Table 9).

Research question #2 asked what differences existed among group means of academic achievement among college freshmen males, college freshmen females, college junior males, and college junior females if the effect of field dependence-independence is removed. The group mean on this measure for freshmen males was 2.56 and for freshmen females, 2.98. The group mean for junior males was 2.83 and for females, 2.96 (see Table 8). Freshmen males tended to have lower levels of academic
### Table 8

**Group Means and Standard Deviation Scores on Research Variables**

<table>
<thead>
<tr>
<th></th>
<th>Field Dep-Indep</th>
<th>Academic Adjustment</th>
<th>Social Adjustment</th>
<th>Perceived Satisfaction</th>
<th>Sophistication</th>
<th>Conceptual Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{x}$</td>
<td>$s$</td>
<td>$\bar{x}$</td>
<td>$s$</td>
<td>$\bar{x}$</td>
<td>$s$</td>
</tr>
<tr>
<td><strong>Freshmen</strong></td>
<td>9.43</td>
<td>4.86</td>
<td>2.79</td>
<td>.67</td>
<td>44.35</td>
<td>6.27</td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td>8.80</td>
<td>5.40</td>
<td>2.56</td>
<td>.70</td>
<td>41.91</td>
<td>6.49</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td>9.90</td>
<td>4.41</td>
<td>2.38</td>
<td>.58</td>
<td>46.38</td>
<td>5.39</td>
</tr>
<tr>
<td><strong>Juniors</strong></td>
<td>11.22</td>
<td>4.50</td>
<td>2.90</td>
<td>.51</td>
<td>47.79</td>
<td>5.51</td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td>12.60</td>
<td>3.98</td>
<td>2.63</td>
<td>.37</td>
<td>48.56</td>
<td>3.66</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td>9.89</td>
<td>4.64</td>
<td>2.96</td>
<td>.61</td>
<td>47.05</td>
<td>6.83</td>
</tr>
</tbody>
</table>
Table 9

Results of ANOVA on Field Dependence-Independence Scores of Class and Sex

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects</td>
<td>100.019</td>
<td>2</td>
<td>50.010</td>
<td>2.338</td>
</tr>
<tr>
<td>Sex</td>
<td>16.240</td>
<td>1</td>
<td>16.240</td>
<td>.759</td>
</tr>
<tr>
<td>Class</td>
<td>81.063</td>
<td>1</td>
<td>81.063</td>
<td>3.789</td>
</tr>
<tr>
<td>2-way interaction</td>
<td>91.921</td>
<td>1</td>
<td>91.921</td>
<td>4.297*</td>
</tr>
<tr>
<td>Total</td>
<td>2373.934</td>
<td>105</td>
<td>22.609</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05.
adjustment than did freshmen females. Differences in group means for junior males and for junior females were not nearly as pronounced, although levels of academic achievement remained slightly higher for junior females than for junior males. An obtained $F = 7.335$ ($p < .05$) indicated that statistical significance existed for sex, but not for class. There was no statistically significant interaction between class and sex on this measure. An obtained $F = 5.236$ ($p < .05$) indicated that statistical significance existed for the covariate, field dependence-independence. It accounted for 4.6 percent of the variation. An obtained $F = 3.810$ ($p < .05$) indicated that statistical significance existed for the main effects of sex and class (see Table 10).

Research question #3 asked what differences existed among group means of social adjustment among college freshmen males, college freshmen females, college junior males and college junior females if the effect of field dependence-independence is removed. The group mean on this measure for freshmen males was 41.91 and for freshmen females, 46.38. The group mean for junior males was 48.56 and for junior females, 47.05. The group mean on this measure for all freshmen was 44.35, and for all juniors, 47.79 (see Table 8). An obtained $F = 5.264$ ($p < .05$) indicated that statistical significance existed for the main effects of class and sex. An obtained $F = 8.506$ ($p < .05$) indicated that statistical significance existed for class, but not for sex. An obtained $F = 6.491$ ($p < .05$) indicated that there was statistically
Table 10

Results of ANCOVA on Academic Achievement of Class and Sex

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate FDI</td>
<td>1.690</td>
<td>1</td>
<td>1.690</td>
<td>5.236*</td>
</tr>
<tr>
<td>Main Effects</td>
<td>2.460</td>
<td>2</td>
<td>1.230</td>
<td>3.810*</td>
</tr>
<tr>
<td>Sex</td>
<td>2.368</td>
<td>1</td>
<td>2.368</td>
<td>7.335*</td>
</tr>
<tr>
<td>Class</td>
<td>.111</td>
<td>1</td>
<td>.111</td>
<td>.343</td>
</tr>
<tr>
<td>2-way interaction</td>
<td>.255</td>
<td>1</td>
<td>.255</td>
<td>.789</td>
</tr>
<tr>
<td>Explained</td>
<td>4.406</td>
<td>4</td>
<td>1.101</td>
<td>3.411*</td>
</tr>
<tr>
<td>Residual</td>
<td>32.609</td>
<td>101</td>
<td>.323</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>37.015</td>
<td>105</td>
<td>.353</td>
<td></td>
</tr>
</tbody>
</table>

*P < .05.
significant interaction between class and sex. The covariate, field dependence-independence accounted for 1.4 percent of the total variance on this measure and was not statistically significant (see Table 11).

Research question #4 asked what differences existed among group means of perceived satisfaction among college freshmen males, college freshmen females, college junior males and college junior females if the effect of field dependence-independence is removed. The group mean on this measure for freshmen males was 31.80 and for freshmen females, 41.57. The group mean for junior males was 47.24 and for junior females, 41.65. The group mean on this measure for all freshmen was 37.13, and for juniors, 44.39 (see Table 8). An obtained $F = 5.602$ indicated that statistical significance existed for the main effects that class and sex have on this measure. An obtained $F = 9.891$ ($p < .05$) indicated that statistical significance existed for class, but not for sex. An obtained $F = 11.578$ ($p < .05$) indicated that there was statistically significant interaction between class and sex. The covariate, field dependence-independence accounted for 2.6 percent of the total variance on this measure and was not statistically significant (see Table 12).

Research question #5 asked what differences existed among group means of sophistication of body concept among college freshmen males, college freshmen females, college junior males and college junior females if the effect of field dependence-independence is removed. The
Table 11

Results of ANCOVA on Social Adjustment of Class and Sex

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate FDI</td>
<td>56.099</td>
<td>1</td>
<td>56.099</td>
<td>1.699</td>
</tr>
<tr>
<td>Main Effects</td>
<td>347.678</td>
<td>2</td>
<td>173.839</td>
<td>5.264*</td>
</tr>
<tr>
<td>Class</td>
<td>280.909</td>
<td>1</td>
<td>280.909</td>
<td>8.506*</td>
</tr>
<tr>
<td>Sex</td>
<td>72.139</td>
<td>1</td>
<td>72.139</td>
<td>2.184</td>
</tr>
<tr>
<td>2-way interaction</td>
<td>214.362</td>
<td>1</td>
<td>214.362</td>
<td>6.491*</td>
</tr>
<tr>
<td>Explained</td>
<td>618.140</td>
<td>4</td>
<td>154.535</td>
<td>4.680*</td>
</tr>
<tr>
<td>Residual</td>
<td>3335.403</td>
<td>101</td>
<td>33.024</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3953.543</td>
<td>105</td>
<td>37.653</td>
<td></td>
</tr>
</tbody>
</table>

*P < .05.
Table 12

Results of ANCOVA on Perceived Satisfaction of Class and Sex

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate FDI</td>
<td>397.735</td>
<td>1</td>
<td>397.735</td>
<td>3.308</td>
</tr>
<tr>
<td>Main Effects</td>
<td>1346.859</td>
<td>2</td>
<td>673.430</td>
<td>5.602*</td>
</tr>
<tr>
<td>Class</td>
<td>1189.121</td>
<td>1</td>
<td>1189.121</td>
<td>9.891*</td>
</tr>
<tr>
<td>Sex</td>
<td>174.850</td>
<td>1</td>
<td>174.850</td>
<td>1.454</td>
</tr>
<tr>
<td>2-way interaction</td>
<td>1391.873</td>
<td>1</td>
<td>1391.873</td>
<td>11.578*</td>
</tr>
<tr>
<td>Explained</td>
<td>3136.468</td>
<td>4</td>
<td>784.117</td>
<td>6.522*</td>
</tr>
<tr>
<td>Residual</td>
<td>12142.438</td>
<td>101</td>
<td>120.222</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15278.906</td>
<td>105</td>
<td>145.513</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05.
group mean on this measure for freshmen males was 3.32 and for freshmen females, 2.53. The group mean for junior males was 2.52 and for junior females, 2.77. The group mean on this measure for all freshmen was 2.89, and for juniors, 2.65 (see Table 8). An obtained $F = 5.248$ ($p < .05$) indicated that there was statistical significance for sex but not for class. An obtained $F = 4.955$ ($p < .05$) indicated that there was statistical significance for the interaction of class and sex. The covariate, field dependence-independence accounted for 22 percent of the total variance on this measure. An obtained $F = 31.479$ ($p < .05$) indicated that there was statistical significance for the covariate. (see Table 13).

Research question #6 asked what differences existed among group means of levels of conceptual maturity among college freshmen males, college freshmen females, college junior males and college junior females if the effect of field dependence-independence is removed. The group mean on this measure for freshmen males was 85.32 and for freshmen females, 99.23. The group mean for junior males was 96.96 for males and for junior females, 97.39. The group mean on this measure for all freshmen was 92.91, and for juniors, 97.18 (see Table 8). An obtained $F = 3.535$ ($p < .05$) indicated that there was statistical significance for the main effects of class and sex. An obtained $F = 6.680$ ($p < .05$) indicated that there was statistical significance for sex, but not for class. An obtained $F = 4.955$ ($p < .05$) indicated that there was statistically significant interaction between class and sex.
Table 13

Results of ANCOVA on Sophistication of Body Concept of Class and Sex

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate FDI</td>
<td>20.385</td>
<td>1</td>
<td>20.385</td>
<td>31.479*</td>
</tr>
<tr>
<td>Main Effects</td>
<td>3.570</td>
<td>2</td>
<td>1.785</td>
<td>2.756</td>
</tr>
<tr>
<td>Class</td>
<td>.202</td>
<td>1</td>
<td>.202</td>
<td>.311</td>
</tr>
<tr>
<td>Sex</td>
<td>3.399</td>
<td>1</td>
<td>3.399</td>
<td>5.428*</td>
</tr>
<tr>
<td>2-way interaction</td>
<td>3.209</td>
<td>1</td>
<td>3.209</td>
<td>4.955*</td>
</tr>
<tr>
<td>Explained</td>
<td>27.163</td>
<td>4</td>
<td>6.791</td>
<td>10.487*</td>
</tr>
<tr>
<td>Residual</td>
<td>65.403</td>
<td>101</td>
<td>.648</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>92.566</td>
<td>105</td>
<td>.882</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05.
Table 14

Results of ANCOVA on Level of Conceptual Maturity
of Class and Sex

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate FDI</td>
<td>3893.382</td>
<td>1</td>
<td>3893.382</td>
<td>13.974*</td>
</tr>
<tr>
<td>Main Effects</td>
<td>1969.680</td>
<td>2</td>
<td>948.840</td>
<td>3.535*</td>
</tr>
<tr>
<td>Class</td>
<td>126.493</td>
<td>1</td>
<td>126.493</td>
<td>.454</td>
</tr>
<tr>
<td>Sex</td>
<td>1861.195</td>
<td>1</td>
<td>1861.195</td>
<td>6.680*</td>
</tr>
<tr>
<td>2-way interaction</td>
<td>504.598</td>
<td>1</td>
<td>504.598</td>
<td>1.811</td>
</tr>
<tr>
<td>Explained</td>
<td>6367.660</td>
<td>4</td>
<td>1591.915</td>
<td>5.714*</td>
</tr>
<tr>
<td>Residual</td>
<td>28140.189</td>
<td>101</td>
<td>278.616</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34507.849</td>
<td>105</td>
<td>328.646</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05.
The covariate, field dependence-independence account for 11.3 percent of the total variance on this measure. An obtained $F = 13.974$ ($p < .05$) indicated that the covariate was statistically significant (see Table 14).

**Summary**

This chapter presented the results of the statistical analyses addressing the research questions posed in Chapter One. An overview of the purpose, research design, and method of statistical analyses was presented. Demographic data were also presented. Chapter Five presents a summary of this study, conclusions, discussion, and recommendations for future research.
Chapter Five

Summary, Conclusions, Discussion, and Recommendations

This chapter is divided into four sections: summary, conclusions, discussion and recommendations. An overview of the study is included in the summary, while the recommendations address further possibilities to use in investigating the effects psychological differentiation have on the interaction of academic/social aspects—as they provide for success or failure for the college student.

Summary

The purpose of this study was to determine whether differences exist in the cognitive/personal style of college students as it interacts with academic achievement, social adjustment, perceived satisfaction with subjects' academic endeavors, sophistication of body concept and level of conceptual maturity. Do these factors provide for success or failure in college. Are there significant change in these measures between the freshmen and junior years?

The research design for this study consisted of: (1), a 2 X 2 between groups design for freshmen males, freshmen females, junior males and junior females and for measures of field
dependence-independence; (2), a 2 X 2 between groups design for freshmen males, freshmen females, junior males and junior females, for measures of field dependence-independence and for measures of academic adjustment, social adjustment, perceived satisfaction with one's academic endeavors, sophistication of body concept and conceptual maturity.

The research design included two treatment groups divided by sex: college freshmen males, college freshmen females, college junior males and college junior females. Each group was rated on (1) degree of field dependence-independence as measured by the Group Embedded Figures Test, (2) college grade point average, (3) estimates of sophistication of body concept and conceptual maturity taken from the Draw-A-Person Test, and (4) measures of personal and social adjustment and perceived satisfaction with one's academic endeavors taken from the California Personality Inventory.

The data collected in this study was analyzed in the following manner. One, the 2 X 2 between groups design for freshmen males, freshmen females, junior males and junior females was analyzed via a 2 X 2 Analysis of Variance (ANOVA) procedure with field dependence-independence used as a dependent variable. Two, the 2 X 2 between groups design for freshmen males, freshmen females, junior males and junior females, was analyzed via a 2 X 2 Analysis of Covariance (ANCOVA) with field dependence used as a covariate and academic achievement, social adjustment, perceived satisfaction, sophistication of body concept and level of conceptual maturity used as
dependent variables.

One group of subjects who participated in this study were students in a college freshmen Contemporary Issues class (a two-semester ongoing orientation program) taught by faculty members from various departments and disciplines. As mentioned in the Limitation of this study, students were assigned to these classes as the college received their enrollment deposit. The course was offered from 2:00-3:00 in the afternoon on Monday and Wednesday. As mentioned in the Limitations of the study, the educational level of the freshmen group consisted of a high school education and one semester of college. There were 25 males and 30 females.

The second group of subjects who participated were classified as second semester juniors (having completed more than 60 semester hours). They were selected randomly from the Schools of Arts and Humanities, Sciences, Business, and Education. As mentioned in the Limitations of the Study, the educational level of college juniors consists of a high school diploma and at least 60 semester hours of college courses. There were 25 males and 25 females.

A selected review of the literature indicates that cognitive style has a consistent, long-term effect. Its impact appears to be observable in an individual's perceptual, intellectual, emotional, motivational, defensive, and social operations.

Specific areas of intelligence tests i.e., subtests that measure analytical ability appear to have a significant relationship with cognitive style. There appears to be an interrelation between
intellectual abilities and cognitive controls. The Picture Completion, Block Design, and Object Assembly Subtests of the Wechsler Intelligence Scales appear to be positively correlated with Witkin's Embedded Figures Test of field-dependence vs. field-independence.

Field-dependence-independence appears to be closely correlated with certain academic choices of and achievement in specific areas of studies, that is, mathematics and the natural sciences. Students who exhibited a field-dependent orientation tended to gravitate toward domains that featured an interpersonal orientation, for example, education and social work, whereas students who exhibited a field-independent orientation tended to gravitate toward domains that featured an impersonal orientation for example, mathematics and the natural sciences. The use of cognitive style in vocational interest patterns and specific vocational counseling does not appear to be efficacious in that vocational interest patterns tended to cluster themselves around more general personality dispositions rather than around cognitive style.

An individual's cognitive style appears to have an impact on the teaching-learning process. Field-independent students appear to be more adept at problem-solving tasks and to be better able to impose their own organization onto a situation when the situation lacked structure than did their field-dependent counterparts. In addition, their cognitive orientation may influence their preference to engage in solitary situations and to prefer school subjects that tend to be impersonal and abstract. Lastly, they do not appear to be swayed by
social reinforcement.

The field-dependent student appeared to be less adept at problem-solving tasks, and was more sensitive and consequently more dependent upon the social structure in finding solutions to tasks. They had greater difficulty imposing structure of their own onto a situation and functioned more effectively when explicit directions were presented with the problem-solving task. These students preferred social vs. solitary activities and were more highly motivated in classroom situations that were more personal and interactional. Social reinforcement and response contingent reinforcement had a greater effect on these students than on field-independent students.

It has also been demonstrated that there are significant differences between cognitive style and personality characteristics. Field-dependent individuals needed environmental support and did not impose themselves on their environment nearly as much as their field-independent counterparts. They also appeared to be reticent to initiate activity and were more willing to submit themselves to the forces of authority. These individuals had greater difficulty integrating seemingly hostile elements, for example, unacceptable sexual impulses into their personalities. As a group, they tended to have a lower level of self-esteem than comparable group of field-independent individuals.

In contrast, field-independent individuals tended to require little support from their environments, were willing and able to initiate and organize activities, and were less willing to submit
themselves to the forces of authority. They appeared to be better able to integrate the existence of hostile and sexual impulses into their personalities and to effectively discharge these impulses in appropriate channels without undue distress than were field-dependent individuals. They tended to have a higher level of self-esteem than their counterparts.

Conclusions

From the statistical analyses, differences in field dependence-independence were found among freshmen males and freshmen females. There was movement from the slightly field-dependent range to the slightly field-independent range between the freshmen and junior years for males, but not for females. Females remained consistent in their scores from the freshmen to the junior years. The consistency for females from the freshmen to the junior years supports data from other studies that indicate that there are no significant changes in levels of field dependence-independence after age 16, whereas scores for males tended to contradict these data.

Females tended to improve from the freshmen to the junior years on measures of academic achievement. Mean rates of improvement for males was greater than for females, yet females tended to maintain higher levels of academic achievement at both the freshmen and junior levels. Both males and females at the freshmen and junior levels maintained satisfactory levels of academic achievement.
Freshmen females also tended to have higher levels of social adjustment than did freshmen males. Males tended to demonstrate greater levels of improvement from the freshmen to the junior years than did females. Levels of social adjustment for freshmen males was not considered to be indicative of adequate social adjustment, whereas for freshmen females, junior males and junior females, levels of social adjustment was considered to be indicative of adequate social adjustment.

Measures for freshmen males on measures of perceived satisfaction with subjects' academic endeavors was extremely low, and not considered to be indicative of satisfaction. Measures for freshmen females was higher than the mean score for males, yet it was not considered to be indicative of satisfaction. Measures for junior males increased dramatically, being indicative of satisfaction. Measures junior females remained at the same level and was not considered to be indicative of satisfaction.

Measures of levels of sophistication of body concept indicated that freshmen females tended to have greater sophisticated body concepts than did freshmen males. Measures indicated that sophistication of body concept for males increased, whereas measures for females decreased from the freshmen to the junior years. Scores for freshmen males indicated that they were classified within the intermediate range of body sophistication, whereas freshmen females were classified within the moderate range on drawings of body sophistication. Both junior males and females were classified within
the moderate range of body sophistication.

Levels of conceptual maturity were greater for females than they were for males. Measures for junior males increased, whereas measures for junior females decreased slightly. Measures for males and females at both the freshmen and junior years were considered to be within the average range on measures of conceptual maturity.

Discussion

As a result of this study, it appears that cognitive style does have a consistent, long-term effect for females, but perhaps not for males. There do not appear to be significant changes in the number of subjects who were field dependent versus field independent at the freshmen versus the junior year for females, but there were for males. Sex does not appear to play a role in determining which subjects were field dependent versus which subjects were field independent.

Levels of academic achievement increased between the freshmen and junior years, however it does not appear to be a greatly affected by the field dependence-independence dimension. Rather it appears to be a function of other factors, for example, greater levels of maturity, greater motivation based on a clearer picture of what college major subjects are pursuing and the academic expectations these academic areas hold for their students. The fact that both groups met criteria for academic achievement may be a function of subjects being motivated to meet minimum criteria for college admission. In addition, a
sufficient level of academic achievement may be a function of greater intellectual capacities, enriched socioeconomic backgrounds, and/or greater parental expectations.

Higher levels of social adjustment for freshmen females does not appear to be related to levels of field dependence-independence. Rather, it may be a factor of greater levels of maturation. It appears that males acquire greater levels of social adjustment between the freshman and junior years.

Perceived satisfaction with subjects' academic endeavors appeared to greatly increase from the freshmen to the junior years. Perhaps this increase is also a function of greater levels of maturity, and/or a more accurate picture of academic expectations and greater skill levels to meet academic expectations.

Sophistication of body concept and level of conceptual maturity appear to have the greatest ties with the field dependent-independent dimension. The percentage of influence field dependence-independence had on class and sex was much larger than for academic achievement, social adjustment, and perceived satisfaction. This appears to be consistent with the research data.

Thus, field dependence-independence does appear to have its greatest effect on levels of sophistication of body concept and level of conceptual maturity, and to have a lesser effect on levels of academic adjustment, social adjustment and perceived satisfaction. Thus, the results of this study generally appear to coincide with the body of research generated by Witkin and others on psychological
differentiation for males, and to a lesser degree for females. Greater levels of development in females may be a factor in attempting to understand the differences observed between males and females between the freshmen and junior years.

The concept of psychological differentiation does appear to be relevant to the college student, as a means of beginning to understand the interrelationship between academic and social aspects. Psychological differentiation does appear to reveal a glimpse of a personality variable that influences the academic and social aspects for the college student. However, much more research needs to be conducted in order to accurately delineate aspects of this variable. Various facets of the human personality are unveiled through personality research, yet significant portions continue to remain a mystery...thus the need for further and more intensive research in the area of psychological differentiation.

Recommendations for further study

It is recommended that data be collected from students at the beginning of the freshmen year and then retest at the beginning of the sophomore, junior and senior years to determine if changes in levels of psychological differentiation, academic achievement, social adjustment, perceived satisfaction, sophistication of body concept and level of conceptual maturity occur during a student's college years. Two, it is recommended that subject pools be chosen from specific academic majors
to determine if greater or less differences occur in levels of psychological differentiation, academic achievement, social adjustment, perceived satisfaction, sophistication of body concept and level of conceptual maturity occur more readily in one academic major versus another. Three, it is recommended that data generated on the level of field dependence-independence be used in a way that would delineate who was slightly, moderately, and greatly field independent and who was slightly, moderately, and greatly field dependent to further clarify the field dependent-independent issue. Four, it is recommended that subjects be informed of their scores on field dependence-independence, academic achievement, social adjustment, perceived satisfaction, sophistication of body concept, and level of conceptual maturity and subsequently retest to determine if knowledge of the above criteria brings about greater amounts of change than no knowledge. Five, it is recommended that additional means of rating academic achievement and social adjustment, for example, ACT and SAT scores, teacher ratings, student ratings, etc. be used to further clarify these dimensions. Six, it is recommended that results from the above measures be used in college student personnel work, for example, housing, programming, and counseling. Finally, it is recommended that the theoretical aspects of psychological differentiation need to be carefully scrutinized and appropriate revisions made to accommodate developmental changes in the latter adolescent period.
LIST OF REFERENCES


