1-1-1983


Harry Bayard Schiller

University of Massachusetts Amherst

Follow this and additional works at: https://scholarworks.umass.edu/dissertations_1

Recommended Citation


https://scholarworks.umass.edu/dissertations_1/3915

This Open Access Dissertation is brought to you for free and open access by ScholarWorks@UMass Amherst. It has been accepted for inclusion in Doctoral Dissertations 1896 - February 2014 by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.
DEVELOPMENTAL STAGE MATCHING IN PSYCHOLOGICAL EDUCATION:
RELATIONSHIP BETWEEN PARTICIPANT SELF-KNOWLEDGE LEVEL
AND SUCCESS IN EDUCATION OF THE SELF

A Dissertation Presented
By
HARRY BAYARD SCHILLER

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of
DOCTOR OF EDUCATION
May 1983
Education
"Education, in the true sense, is the understanding of oneself, for it is within each one of us that the whole of existence is gathered."

J. Krishnamurti
DEVELOPMENTAL STAGE MATCHING IN PSYCHOLOGICAL EDUCATION:
RELATIONSHIP BETWEEN PARTICIPANT SELF-KNOWLEDGE LEVEL
AND SUCCESS IN EDUCATION OF THE SELF

A Dissertation Presented
By
HARRY BAYARD SCHILLER

Approved as to style and content by:

Gerald Weinstein, Chairperson

Professor William Matthews, Member

Professor Theodore Slovin, Member

Hariharan Swaminathan, Acting Dean
School of Education
DEDICATION

This dissertation is dedicated to the loving memory of Tatum who shared with me ten years of devotion and companionship in ways more deeply felt than ever before or since.
ACKNOWLEDGMENTS

This dissertation represents for me the culmination of several years of exploration and inquiry in the field of psychological education. It would never have been completed without the assistance and support of several people whom I wish to acknowledge for their contributions to my work.

Certainly, few people have had as great an impact upon me professionally as has Jerry Weinstein, who introduced me to the field of psychological education several years ago. Since that time he has played a central role in my development as a psychological educator and as a trainer. It was through Jerry that I first learned of Self-knowledge Theory and had my first personal encounter with psychological education (by enrolling in his course, Education of the Self). Throughout my experience with this field, Jerry provided for me an important role model of what a trainer in psychological education could and should be. His unique contributions to my development as an educator will always be a part of me.

Once I had established that my dissertation would involve both Self-knowledge Theory and Education of the Self, it became clear that Jerry, as co-author of the theory and originator of the course, was without doubt, ideally suited for the role of chairman of my committee.
Throughout the conceptualization and writing of the dissertation, Jerry was helpful in many ways, particularly in focusing the inquiry into a manageable study. Working with Jerry was always both challenging and personally enriching -- in the true psych ed tradition our meetings led me to personal insights as often as they led me to learning about the subject. Finally, I wish to thank Jerry for his clear and creative thinking and for his agility in constantly steering me back to the forest at the expense of some of the trees -- otherwise I would still be writing.

I also am greatly indebted to Bill Matthews and to Ted Slovin for serving on my committee and for sharing with me the questions, frustrations, and learnings, and for their commitment to see me through this process. Bill was particularly helpful during the writing of the proposal and later with the design and methodology of the study. I also appreciated Bill's accessibility and sense of humor, and his willingness to play more than one role in the personal dramas that unfolded. Ted, as the outside member of the committee, was wonderfully supportive and added to the committee a broader perspective than I otherwise would have experienced. I appreciated his attention to me and to the process as well as his willingness to share his interests and ideas throughout.

In addition to my committee a number of other people provided assistance and support in many important ways. I credit much of my commitment to this project to three very special women whose encouragement kept my interest alive for many hours beyond what logic and the
threshold of pain seemed to dictate. First, I wish to thank my grandmother Mamie Friedman (Mimi) who was a pillar of strength (as always) throughout this project. Her belief in me and her commitment to my education and future made this dissertation possible. Were it not for her generous financial support during this period of unemployment, I probably would have abandoned education to become a stock broker (A.B.D.). I will always be tremendously indebted to her. I also wish to thank my mother, Lory Goggans, whose untiring encouragement and belief in me has always been my beacon in the storm. During the most difficult periods I encountered, Mom was always there not only as a mother, but as a friend. Finally, I wish to express my thanks to my closest and dearest friend Kirsten Lindblom (special K) who was involved in every phase of the writing and research of this dissertation (and who as a result will probably never write her own). Through Kirsten's companionship, emotional support and intellectual stimulation, she helped to make this process a shared one. Our friendship was tested and strengthened through this experience and by some of the painful events which punctuated this period. Especially during these times Kirsten's capacity for loving and caring was ever-present and strongly felt. I will cherish our friendship always.

This study also depended upon the cooperation of the 55 students enrolled in Education of the Self during the 1981 fall semester. I am most appreciative of those students who participated in this project and shared with me much of their personal learning throughout
the course. My thanks to Steve Botkin and Georganne Greene for administering tests and collecting data in their section. I also wish to thank Linda Murray for her help with the methodology of the study, Thelma Schiller, my stepmother, for typing Chapter IV, Bernie McDonald for typing the final draft, and Pauline Ashby for her assistance and good-natured support throughout this project (and many others).

I would also like to thank my many supportive friends who helped me return to this project after being away from the University for three years. In particular, I wish to thank Marge, Bill, Arlene, Pat, Ken and Laurel, Scott, Elinor, Michael, Ely, Jill, Kate, Mitchell and Annie. My warmest appreciation to Ellie Skinner for sharing with me her experiences, ideas, and frustrations in working on a similar study during this time. Ellie will always be very special to me -- she is a diamond in the rough. And to Joel Ziff whose earlier work provided a base for this study, I am greatly indebted. I also wish to thank Joel for his patience and generosity in sharing his knowledge of Self-knowledge Theory coding procedures and for his time on the phone with me spent reconstructing his dissertation.

Oh, and I would be remiss if I didn't thank the National Football League for planning a players strike which left me with Sundays free to spend on this project.

H.B.S.
ABSTRACT

Developmental Stage Matching in Psychological Education: Relationship Between Participant Self-Knowledge Level and Success in Education of the Self

(May 1983)

Harry B. Schiller, B.A., Stanford University
M.Ed., Harvard University, Ed.D., University of Massachusetts
Directed by: Dr. Gerald Weinstein

The purpose of this study was to determine how a particular developmental theory, the Self-knowledge Stage Theory (Alschuler, Evans, Tamashiro, Weinstein, 1975) could be used in matching a standardized psychological education intervention Education of the Self, to a particular population. Specifically, the central hypothesis of this study was that those course participants whose self-knowledge skills were best matched to the self-knowledge level of the intervention would perform better on course outcome measures than those who were unmatched.

In order to test this hypothesis, two instruments, the Experience Recall Test (ERT) and the Modified Experience Recall Test (MERT) were used to assess the pre-treatment self-knowledge levels of the 55 participants in the course. Data from these two instruments were used to compute scores on each of four self-knowledge measures (MERT-pattern, MERT-process, ERT stage and ERT summary) for all subjects. At the
conclusion of the course, several outcome measures were used to assess learning.

Analysis of data revealed that the ERT stage measure and the MERT pattern measure were both positively and significantly correlated with some of the outcome measures -- particularly the "feedback letter" written by all course participants summarizing their learning in the course. In addition, two other variables, measuring respectively participants' previous experience in psychological education and their "professional" motivation for enrolling in the course, were found to be significantly correlated with participants' performance in the course.

In general this study has implications for the design and implementation of psychological education programs in that it helps to establish guidelines for designing programs matched appropriately to the developmental needs of participants. The study also contributes to the validation and development of Self-knowledge Theory and related measures by utilizing Self-knowledge Theory as a basis for matching a population to an intervention and by providing exploratory data on the use of an alternative self-knowledge assessment instrument (MERT).
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>v</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>ix</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>xiv</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>I  INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>1. Purpose</td>
<td>1</td>
</tr>
<tr>
<td>2. Background and Problem</td>
<td>2</td>
</tr>
<tr>
<td>2.1 Developmental Theory Applications to Psychological Education</td>
<td>6</td>
</tr>
<tr>
<td>2.2 Matching Model Research</td>
<td>7</td>
</tr>
<tr>
<td>3. Significance</td>
<td>9</td>
</tr>
<tr>
<td>3.1 Significance of the Study in Showing the Potential Effectiveness of Using a Matching Model Approach in Psychological Education</td>
<td>10</td>
</tr>
<tr>
<td>3.2 Significance of the Study in Providing Support for the View that Psychological Education Interventions Should be Informed by Developmental Theory</td>
<td>12</td>
</tr>
<tr>
<td>3.3 Significance of the Study in Providing Data Useful to the Validation and Elaboration of Self-knowledge Theory and Related Instruments</td>
<td>13</td>
</tr>
<tr>
<td>4. Organization of the Study</td>
<td>15</td>
</tr>
<tr>
<td>II REVIEW OF THE LITERATURE</td>
<td>17</td>
</tr>
<tr>
<td>1. Introduction</td>
<td>17</td>
</tr>
<tr>
<td>2. Research Trends in Psychological Education</td>
<td>18</td>
</tr>
<tr>
<td>2.1 Psychological Education Related Fields:</td>
<td></td>
</tr>
<tr>
<td>2.1.1 Group Psychotherapy and Human Relations Training Groups</td>
<td>18</td>
</tr>
<tr>
<td>2.2 Research Trends in Psychological Education:</td>
<td>21</td>
</tr>
<tr>
<td>2.2.1 Non-developmental Studies</td>
<td>27</td>
</tr>
<tr>
<td>Applications of Structural Developmental Theory to Psychological Education</td>
<td>29</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Moral Developmental Applications to Psychological Education</td>
<td>29</td>
</tr>
<tr>
<td>Applications of Ego Development Theory to Psychological Education</td>
<td>47</td>
</tr>
<tr>
<td>Applications of Selman's Interpersonal Perspective Taking Theory to Psychological Education</td>
<td>59</td>
</tr>
<tr>
<td>Applications of Self-knowledge Developmental Theory to Psychological Education</td>
<td>63</td>
</tr>
<tr>
<td>Applications of Conceptual Level Developmental Theory—A Contemporaneous Approach</td>
<td>70</td>
</tr>
<tr>
<td>Summary</td>
<td>73</td>
</tr>
</tbody>
</table>

### III METHODOLOGY

<table>
<thead>
<tr>
<th>Introduction</th>
<th>76</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypotheses of the Study</td>
<td>76</td>
</tr>
<tr>
<td>Sample</td>
<td>78</td>
</tr>
<tr>
<td>Design of the Study</td>
<td>78</td>
</tr>
<tr>
<td>Procedures</td>
<td>80</td>
</tr>
<tr>
<td>Instruments and Measures</td>
<td>82</td>
</tr>
</tbody>
</table>

   | Independent Variables | 82 |
   | Demographic Measures | 90 |
   | Dependent Measures | 93 |

<table>
<thead>
<tr>
<th>Data Analysis</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodological Limitations of the Study</td>
<td>105</td>
</tr>
</tbody>
</table>

   | External Validity Issues | 105 |
   | Internal Validity Issues | 107 |

### IV RESULTS OF INVESTIGATION

<table>
<thead>
<tr>
<th>Overview</th>
<th>109</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Sample Population</td>
<td>109</td>
</tr>
<tr>
<td>Description of Participants' Responses on the Experience Recall Test (ERT)</td>
<td>110</td>
</tr>
<tr>
<td>Description of Participants' Responses on the MERT</td>
<td>113</td>
</tr>
<tr>
<td>Inter-coder Reliability Data</td>
<td>113</td>
</tr>
<tr>
<td>Tests of Primary Hypotheses</td>
<td>120</td>
</tr>
</tbody>
</table>

   | Hypothesis 1 | 122 |
   | Hypothesis 2 | 127 |
   | Hypothesis 3 | 129 |
   | Hypothesis 4 | 140 |
Additional Findings ............................................. 142

Pretest/Posttest Gains ........................................... 142
Relationships Between Dependent Variables ................. 142
Relationships Between Independent Variables .............. 144
Relationships Between Demographic Measures and Outcome Measures ............................................. 148

V SUMMARY AND CONCLUSIONS ................................. 153

Introduction .................................................... 153
Summary of Research Findings ................................ 153
Validation and Elaboration of Self-knowledge Theory and Related Instruments ......................... 162

Construct Validity ............................................ 162
Utility of Self-knowledge Theory ............................. 164
Recommended Changes in Design and Scoring Procedures of the ERT .......................................... 164

Clarification of the Relationship Between
the Foundations of Psychological Education
and Developmental Theory .................................... 170
Practical Implications for the Planning
and Design of Psychological Education Programs .......... 172

Implications for a Matching Model Approach
to Psychological Education .................................... 172
The Role of Dissonance in Design of
Psychological Education Programs .......................... 183
Implications for Screening and Admissions Policies .......... 184

Recommendations for Future Research ....................... 186

BIBLIOGRAPHY .................................................. 191

APPENDICES

A DESCRIPTION OF THE INTERVENTION:
EDUCATION OF THE SELF .................................... 200

B INSTRUCTIONS AND INSTRUMENTS ....................... 205

C TABLE 21: SUMMARY TABLES OF REGRESSIONS
USING ALL DEMOGRAPHIC MEASURES .......................... 224
LIST OF TABLES

Table
1  Composition of Sample Population .................................. 111
2  Distribution of Participants' Self-knowledge
   Stage Scores by Group ........................................... 112
3  Distribution of Participants' ERT Summary
   Scores by Group .................................................. 112
4  Relationship Between ERT Stage and Summary Score .......... 114
5  Distribution of MERT Success Scores by Group ............... 114
6  Distribution of MERT Summary Success Scores ............... 115
7  Inter-coder Reliability — Percentage Agreement .......... 119
8  ERT Stage Score Correlations .................................... 124
9  Chi-Square Analysis: ERT Stage by Feedback Letter ...... 126
10 MERT-Pattern ANOVA's ............................................. 130
11 MERT-Pattern Correlations ........................................ 132
12 Chi-Square Analysis: MERT-pattern by
   Feedback Letter .................................................... 134
13 Summary Tables of Multiple Regressions
   Using Four Independent Variables ............................. 136
14 Self-knowledge Independent Measures:
   Correlations with Outcomes ................................... 139
15 MERT-process Correlations ......................................... 141
16 Correlation Matrix of Dependent Measures ................... 143
17 Correlation Matrix of Independent Variables ............... 145
18 Distribution of MERT Scores by ERT Stage .................... 147
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Demographic Measures: Correlations with Outcomes</td>
<td>149</td>
</tr>
<tr>
<td>20</td>
<td>Matching Model Variables Found in Psychological Education</td>
<td>178</td>
</tr>
<tr>
<td>21</td>
<td>Summary Tables of Regressions Using all Demographic Measures</td>
<td>225</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

Purpose

The purpose of this study is to determine to what extent a particular developmental theory — the Self-knowledge Theory developed at the University of Massachusetts (Alschuler, Evans, Tamashiro, Weinstein, 1975) — can be used as a basis for matching a particular standardized psychological education intervention, Education of the Self, to a particular population. By comparing course outcome data for subjects matched and unmatched to the self-knowledge level of the intervention this study provides information regarding the utility of Self-knowledge Theory in a matching model approach to psychological education.

This investigation consists of the following components:

1. Establishment of a rationale for using Self-knowledge Theory as a basis for the matching of participants to a particular psychological education intervention. This rationale will be developed through a review of the literature covering (a) research on the uses of matching in psychological education and related fields, and (b) matching principles utilized specifically in applications of structural developmental theory to psychological education.

2. Development of pre- and post-test measures for assessing learning in the course Education of the Self, and utilization
of existing and modified self-knowledge stage assessment measures.

3. Discussion of implications of the relationships found between variables for (a) design of psychological education interventions, (b) the matching of client developmental level with content and goals of psychological education interventions, and (c) development of Self-knowledge Theory measures and instruments.

4. Comparison between and discussion of the self-knowledge measures used, including analysis of their relative usefulness as predictors of success in the course, Education of the Self.

5. Recommendations for further research regarding: (a) the design of psychological education interventions, (b) the matching of client developmental needs with intervention content and goals, and (c) the development of Self-knowledge Theory measures and instruments.

Background and Problem

Psychological education (also known as humanistic education) refers to educational interventions designed deliberately to promote personal learning and psychological competence (Skovholt, 1974). Within the context of this broadly defined goal of psychological education, Alschuler (1973) refers to four related categories of goals: (1) To promote the existing aims of education, especially the
often neglected psycho-social goals. (2) To teach students effective and pleasurable processes to reach the goals they choose. (3) To teach positive mental health. (4) To promote normal development.

In achieving these goals, psychological education practices take several forms. Included among these are such approaches as: values clarification, human relations exercises, and a variety of strategies designed to enhance the effectiveness of subject matter instruction.

At the height of the human potential movement, during the 60's and early 70's these psychological (humanistic) education techniques were widely implemented but with little attention given to specific goals and objectives. The framework in most widespread use was probably what has been referred to as the "shot-gun approach", in which several unrelated activities are thrown together for use with a given group with little attention given to purpose or direction except that some will "work" and others won't. This primitive methodology in psychological education is probably largely responsible for much of the criticism directed toward psychological education from outside critics as well as from practitioners within the field. For example, in his review of psychological education Skovholt (1974) discusses the view that psychological education programs are seen by some as "content-less anti-intellectualism." Weinstein (1975) reports that psychological (humanistic) education has also been pejoratively labeled "touchy-feely, non-verbal, anti-religious, anti-intellectual, fuzzy-wuzzy, anti-empirical, self-indulgent, poetic, non-linear, anti-scientific, permissive, structureless, and totally loving" (Weinstein, 1975, p. 8). Sprinthall (1971) notes that psychological education
programs are generally treated as "gimmicks" to add to an ever increasing "bag of tricks."

Though many psychological education programs at least subjectively have proven beneficial to participants, in many cases these programs are implemented with inadequate preparation, inappropriate structure, and poorly defined goals (Skovholt, 1974). Alschuler (1973) notes accordingly in his discussion of "growth center" programs that "the 'here-and-now' ethic and frequent anti-intellectual stance mitigate against the process of clearly conceptualizing, relating the experience to one's 'there-and-then life', choosing, practicing and internalizing" (Alschuler, 1973, p. 217). Short-term superficial learning is typical of such programs. Having a "high" experience, getting "turned on," becoming "aware" are typical slogans of residential personal growth programs. Six months after such experiences, few constructive changes are reported by participants, and learning if any is difficult to articulate (Weinstein, Alschuler, Phillips, 1977).

The lack of an adequate goal framework appears to be contributing to many of these problems cited above (Mosher & Sprinthall, 1971). Not only does the lack of specific goals for activities lead to directionless experiences, but the lack of developmentally appropriate goals can lead to a mismatch between the intervention and the learner often causing him/her unnecessary confusion and frustration and limiting the potential for learning (Kohlberg, 1972).

Psychological education perhaps more so than other educational fields is particularly susceptible to problems caused by developmental "mismatching" between learner and intervention because of the unique
circumstances surrounding the growth of the field. In particular psychological education is based largely upon the human potential and humanistic psychology movements of the 60's in that its origins are based on adult preventive mental health practices. Such procedures as gestalt counseling, psychosynthesis, transactional analysis, and sensitivity training were originally designed primarily for white, middle-class adults (Weinstein, Alschuler, Phillips, 1977). Many psychological education programs and materials for children draw upon the principles, structures, and even the language of these psychological procedures (Canfield, 1976; Weinstein, 1976; Lederman, 1969). Though in some cases modifications are made to account for obvious intellectual differences between children and adults, a number of "adaptations of these procedures have been prescribed for children 'as good things to do' regardless of age, stage of development, sex, race, ethnic background, or cultural context" (Weinstein et al., 1977, p. 86). As Weinstein et al. (1977) points out, we do not know to what extent these procedures are effective or even appropriate for children because the questions surrounding their use have not yet been adequately addressed.

Though the problems confronting psychological education may overlap and impact upon one another to some extent, they have been viewed by some theorists as five relatively distinct issues to be addressed (Alschuler, Phillips, Weinstein, 1977; Phillips, 1980). These problems include (1) the lack of program goals which are theoretically sound, clear, consistent and measurable, (2) the mismatching of teacher behavior and program structure, content and goals to student developmental level,
(3) the haphazard sequencing of activities within a given curriculum or program, (4) the lack of clearly measurable long term learning gains intentionally derived from psychological education programs, (5) the lack of meaningful constructs and instruments used to evaluate psychological education programs.

Developmental Theory Applications to Psychological Education

It has been further suggested by these and other theorists that solutions to many of these problems may be found in grounding theory and practice in a developmentally based goal framework which provides direction for planning of programs and criteria for establishing meaningful and appropriate goals (Weinstein, Alschuler, Phillips, 1977; Mosher & Sprinthall, 1971; Rest, 1974; Skovholt, 1974). This view is manifested in a number of curricular and research efforts which are based upon developmental theory to varying degrees. For example, some theorists (Mosher & Sprinthall, 1971; Higgins, 1980) have drawn upon developmental theories primarily to provide theoretical support for curricular approaches and goals. Others have more directly utilized developmental theories in the design and evaluation of psychological education interventions (Turiel, 1966; Blatt, 1969; Grimes, 1974). As a group, these studies reflect a wide range of theoretical approaches which are based upon several different developmental theories. Among the most commonly cited theories are Kohlberg's Moral Development Theory (1963), Loevinger's Ego Development Theory (1976), Selman's Interpersonal Perspective Taking Theory (1974),

Though there exists considerable research utilizing developmental theory in psychological education, at the present time, there is no widespread use of or agreement upon a single set of developmental criteria which may be used as a theoretical basis for the design and implementation of psychological education interventions. A number of theorists (Phillips, 1980; Ziff, 1979; Weinstein, Alschuler, Phillips, 1977) have argued that in particular, Self-knowledge Developmental Theory provides the most useful and appropriate theoretical foundation for psychological education. In an effort to further substantiate this view, the present study will provide information regarding the utility of Self-knowledge Theory in the matching of a particular population to a particular psychological education intervention. This approach to research involving the matching of the population to the intervention (often through utilizing developmental theory stages) has been referred to as matching model research (Hunt, 1971), a construct which is central to this investigation.

Matching Model Research

Educational researchers continually work to develop improved curricular approaches hoping to improve learner outcomes. And yet learners differ in their responses to various kinds of educational treatments. For example, a particular psychological education program may be very effective for one student and very ineffective for another.
For this reason matching model research is undertaken in order to identify the most appropriate treatment (or curricular approach) for each kind of learner relative to a particular outcome or goal. Subsequently, specific treatments (or programs) are "matched" to specific learner characteristics and program goals in order to enhance learning for each individual or group.

A matching goal, therefore, includes a specified objective and a specific approach or treatment most likely to achieve the objective with a particular subject or population. Combinations of subjects and treatments which promote achievement of the goal are considered matched, while those combinations which do not lead to achievement of the goal are considered mismatched (Hunt, 1971).

Of particular use to the present study is the formulation of a matching model research paradigm, \( B = f(P, E) \), by Hunt and Sullivan (1974) based upon Kurt Lewin's conception that "Behavior (B) is a function of the Person (P) and the Environment (E)" (in Hunt & Sullivan, 1974). This interactive view provides a framework for identifying which treatments (E) are most effective with which types of people (P) in producing which outcomes (B).

B-P-E analysis has been most widely used in research and development of curricular and instructional approaches in academic subject areas (Joyce & Weil, 1972; Hunt & Sullivan, 1974; McLachlan & Hunt 1973). Recently, however, a growing number of psychological education studies have reflected the application of B-P-E analysis to varying degrees. For example, many psychological education research studies utilizing a developmental framework are directed at identifying the most
appropriate match between the individual's or group's developmental level (P) and a particular developmentally based intervention (E) (Blasi, 1972; Hunt, 1977, 1978; Ziff, 1979). In addition, a number of studies from psychological education related fields are designed to identify variables which impact on the outcomes of exercises or treatments thereby providing insight as to the limits or optimum conditions for use of such interventions (Harris, 1976; Rundle, 1977; Ziff, 1979).

The present exploratory study utilizes Self-knowledge Theory as a basis for differentiating the population (P) according to subjects' stage level as measured by two related instruments. This differentiation provides the basis for a post hoc matching of participants with the intervention. If matched subjects perform better than unmatched subjects on course outcome measures in general, then the use of a matching model approach to psychological education may be further supported. In addition, such findings would support the utility of Self-knowledge Theory as a basis for matching participants (P) to interventions (E) in order to maximize program effectiveness.

**Significance**

The determination of a more positive relationship to course outcomes for subjects matched to the intervention than for those unmatched may help to illuminate issues of theory and practice in relationship to both psychological education program development and Self-knowledge Theory as well as to the interface between them. Specifically, it is
hoped that this study may (a) provide data on the potential effectiveness of utilizing a client/treatment matching model in the implementation of a psychological education program by matching participant self-knowledge level with program criteria, (b) contribute to the evaluation of the proposition that psychological education interventions should be informed by developmental theory, (c) provide data useful to the further validation and elaboration of Self-knowledge Theory and related instruments.

Significance of the Study in Showing the Potential Effectiveness of Using a Matching Model Approach in Psychological Education

A number of problems inherent in the practice of psychological education programs have been discussed. Learning outcomes appear in many cases to be minimal. It must be assumed that psychological education programs or teachers are in some way failing. Yet, steps can be taken to improve upon existing programs or to design more effective ones for given student populations. In particular, the design and implementation of these programs can be modified to increase the likelihood of positive learning outcomes by identifying variables which affect learning. For example, such variables as leader empathy, cognitive sophistication of participants, and prior acceptance of goals by participants, have been correlated with positive learning outcomes in the use of structured exercises (Eisenstadt, 1967; Pfeiffer & Jones, 1975, in Ziff, 1979). It has been suggested that
self-knowledge level may be related to participants' learning in psychological education programs in general (Weinstein, 1976; Phillips, 1980). If this is shown to be the case, then it may be possible to systematically improve learning outcomes of psychological education programs by matching the participant to the intervention on the basis of self-knowledge developmental level.

It would be assumed that if a psychological education program or exercise required the use of abilities considerably beyond the level of development of the student, he/she would be unable to appropriately respond to program requirements or instructions and consequently could not achieve the goals of the program as the result of such a mismatch. On the other hand, students should manifest positive attitudes toward programs and enhanced learning through encountering exercises which are matched to their level of self-knowledge. Several theorists have suggested that ideally programs should be matched one stage above the student's level thus maximizing the challenge and potential growth resulting from an experience (Selman, 1975; Kohlberg & Mayer, 1972).

In order to determine if differentiated outcomes such as those cited above occur for subjects matched and unmatched to the intervention of this study, a matching model approach will be utilized. The study will thus include subjects varying in their self-knowledge levels who will on this basis be designated as either matched or unmatched to the intervention. The psychological education intervention which will be used in this study, Education of the Self, is a program designed for students with self-knowledge skills associated with the
higher self-knowledge stages. It will be assumed then that Education of the Self will not be an effective learning vehicle for students who function predominately at the lower self-knowledge stages, while the course should prove beneficial for those students who exhibit self-knowledge capacities of the upper stages.

If the study results in differentiated learning outcomes for students grouped according to differing self-knowledge levels then such findings would support the use of Self-knowledge Theory in matching model approaches to the planning and design of psychological education programs. It would further support the position that matching approaches can be used in psychological education in order to enhance student learning outcomes.

Significance of the Study in Providing Support for the View that Psychological Education Interventions Should be Informed by Developmental Theory

Regardless of the results of this study, the addition of this particular study to the field of developmental theory research may provide useful data on the value and practicality of using developmental theory in the planning of psychological education curricula. This study thus begins to address the criticism posed by Rest (1974) that research has not adequately examined issues of the use of developmental theory in curriculum development. Though a number of studies have shown that stage gains along developmental continua can be achieved through particular psychological education interventions
(Mosher & Sprinthall, 1970, 1971; Turiel, 1966; Blatt, 1969; Blatt & Kohlberg, 1974; Fenton, 1976) these interventions have not been specifically designed or sequenced according to the developmental criteria of specific stages. The intervention used in this study is, however, to some extent designed according to developmental stage criteria. Though the day-to-day sequencing of activities is not always developmentally based, the underlying cognitive organizer (the Trumpet, see Appendix A) and the overall curriculum of the course reflect the developmental stage criteria of the Self-knowledge Theory. Furthermore by assessing student self-knowledge level prior to the intervention, there will be a post hoc matching of this intervention to some of these students' developmental levels. In effect this study simulates the conditions of implementing a developmentally based curriculum according to learner developmental needs. Inferences may accordingly be made on the basis of the data analysis as to the potential usefulness of Self-knowledge Theory in providing direction and a theoretical base to the planning of psychological education programs.

Significance of the Study in Providing Data Useful to the Validation and Elaboration of Self-knowledge Theory and Related Instruments

The principal architects of Self-knowledge Theory have indicated the need for further research involving the theory which might lead to improved construct validity, improved reliability and simplicity of the ERT, and greater usefulness and accessibility of the theory in
general (Alschuler, Evans, Tamashiro, Weinstein, 1975). The existence of a positive correlation between a person's self-knowledge level and his/her success in the course Education of the Self may add to construct validity of the theory through the empirical confirmation of an otherwise hypothetical construct. If it can be shown, for example, that only students with upper stage self-knowledge abilities are successful in the course then this would add to the validity of the self-knowledge construct. In addition such a finding would support the use of the theory in the design of psychological education curricula thus enhancing the utility of the theory as well.

Self-knowledge Theory in accordance with the assumptions of structural developmental theory predicts that self-knowledge development will not be affected by situation-specific factors, that a person has a definable and relatively stable set of self-knowledge capabilities. This hypothesis can be demonstrated through the existence of a relationship between scores achieved on self-knowledge instruments (discussed below) and the Education of the Self pre- and post-tests. To the extent that there is some degree of consistency or clustering of participants' scores over this variety of self-knowledge related measures, additional testimony in support of the validity of the self-knowledge construct may be provided. It may then be inferred that self-knowledge level remains relatively stable regardless of such particulars as questions asked or content of responses.

The present study may also support the development of an alternative, simpler self-knowledge measure than is currently available. At this time the only validated self-knowledge instrument available is
the ERT, which requires approximately forty-five minutes to administer and up to thirty minutes to score. In addition the ERT scoring procedures used are complex and necessitate extensive training. Because of the difficulties involved in using the ERT to determine stages of subjects, the utility of the theory has been somewhat limited. The need for an alternative measure has been strongly recommended in a previous study in which preliminary research in the development of such an instrument has been completed (Ziff, 1979). Based in part on this research, an instrument referred to as the Modified Experience Recall Test (MERT) has been developed for use in this study (see Chapter III). This instrument in contrast to the ERT requires only the scoring of a few stage-linked questions in assessing subjects' self-knowledge capabilities. Coding may thus be simplified and coding error minimized. To the extent that the findings of this study reveal that the MERT is a valid and reliable measure of subjects' self-knowledge stage, the use of this measure may provide further support for the development of an alternative, simpler self-knowledge measure than is currently available. In addition, by furthering efforts to improve upon self-knowledge assessment procedures the accessibility and utility of Self-knowledge Theory may be enhanced as well.

Organization of the Study

This study consists of five chapters. Chapter I includes an introduction to the study, statement of the problem, significance of the study, and organization of the five chapters of the study. Chapter
II reviews the relevant literature. Chapter III, the methodology chapter, includes a description of design, overview of procedures, description of the sample, development and description of instruments, and overview of statistical analysis used. Chapter IV provides results of the study including data relevant to validity and reliability of instruments used, as well as the testing of the hypotheses of the study. Chapter V provides a summary of the results and includes discussion of implications of the study as well as recommendations for future research.
CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The purpose of the review of the literature is to provide a context and a framework through which to further establish the rationale for the study, to support underlying assumptions, and to further articulate the significance of the study.

This study represents an effort to define a relationship between a particular developmental theory (the Self-knowledge Stage Theory) and a psychological education intervention. The literature review accordingly consists of the examination of related efforts.

The review consists of two sections. In the first section a matching model approach will be used to evaluate non-developmental studies drawn from psychological education and related fields. In the second section specific applications of developmental theory to psychological education will be reviewed with particular attention given to studies utilizing matching model principles. The first section will begin below with a discussion of the use of matching model principles in studies drawn from group psychotherapy, human relations training programs and T-groups.
Research Trends in Psychological Education

Psychological Education Related Fields: Group Psychotherapy and Human Relations Training Groups

Bednar's (1974) review of group psychotherapy outcome studies covering 45 studies from 1946-1970 indicates an emphasis in the research literature in describing the effects of environments on outcomes (E->B). That is, a number of studies focus on such trainer characteristics as degree of empathy, warmth, genuineness, etc., or group qualities such as group atmosphere or group unity relative to outcomes of psychotherapy. There appear to be no attempts at matching characteristics of participants (P) to types of treatments (E). Furthermore, a somewhat sobering fact is that in two-thirds of the studies reviewed there were no references to differentiation or even description of treatment techniques, theoretical models, group goals or theoretical orientation. For this reason, these studies could be of no use in identifying variables influencing treatment outcomes.

A noteworthy exception to this trend in the group psychotherapy literature is the study of Abramowitz, Abramowitz, Robach and Jackson (1974) in which differentiated treatments (E) were matched to participant characteristics (P). Here the four treatment groups were defined by, respectively, directive and non-directive therapy styles of the leaders. Participating subjects were assigned to an internal or external locus of control category (Rotter, 1966). As expected, the "external" subjects showed greater improvement in the directive groups
and the "internal" subjects showed greater gains in the non-directive groups.

The literature from human relations training programs, including sensitivity training or T-groups appears to more frequently take into account individual differences (P). The importance of matching participant goals, expectations, and learning needs to type of exercises (E) has been well supported (Thayer, 1976; Jones and Pfeiffer, 1972). Eisenstadt (1967) identified such factors as participant readiness to learn and to apply learnings, cognitive sophistication and perceived power at home as contributing to success in T-groups. The comprehensive study of T-groups by Yalom, Lieberman and Miles (1973) identifies several treatment variations (E) including leader style, content focus, climate factors and their impact on such outcomes (B) as participants' behavior change, self esteem level, value and attitude change, and participants' external relationships. In addition 37 personality indices (P) such as values relative to personal change, degree of psychological adequacy (including self esteem level) personality traits (suspiciousness, authoritarianism) and interpersonal conceptions of significant others were assessed for each participant in order to identify variables which predicted outcome. The two most powerful predictors were the participants' values and conception of others.

An additional example of relationships between population characteristics and outcome (P+B) is discussed as a research generalization in a review of T-group research by Luke and Seashore (1966). These authors suggest that "an inverse relationship exists between
the congruency of the trainee's behavioral style (P) with the laboratory milieu (E) and his relative level of learning (B) . . ."

To support this view three studies are cited in which task or work-oriented group members and members preferring high structure gained more from groups with low structure and/or non-task orientations than other members with characteristics "matched" to the T-group format. The explanation suggested is that the mismatch is dissonance-producing and thereby leads to greater self-examination and experimenting with behavior than occurs with the more person-oriented members (whose behavioral style is more congruent with the T-group format).

The term "matched" therefore takes on an idiosyncratic meaning in this study. Those trainees whose behavioral style was most dissimilar to the treatment orientation were actually matched relative to outcome. Though the basis of the match was not the similarity between treatment and population, but rather the dissimilarity, this inverse relationship was the most effective relationship identified. Accordingly, just as there are several types of matching models (Mexoff, 1980), there are several types of matching relationships which lead to positive outcomes of treatments. This study suggests that in the search for matching relationships between variables the researcher must keep in mind that a potential match may exist whenever different treatments or different populations yield differential effects.
Research Trends in Psychological Education: Non-development Studies

The following discussion of non-developmentally based psychological education studies is presented in order to further document the limitations of past research relative to matching principles and to lend support to the need for a developmentally based psychological education research paradigm. Though this discussion of research studies is not intended to be comprehensive, the literature and research cited is representative of the fields from which it is drawn.

Psychological education as defined in Chapter I is a fairly broadly defined field including a wide range of curricular activities or programs intended for use with a correspondingly broad target population. This discussion will consider only those programs implemented in educational settings designed at least in part to promote the psychological health of participants. Included in this discussion are examples of curriculum development projects, values clarification approaches integrated with various subject matter areas, guidance and mental health programs, human relations training programs for students as well as teachers, achievement motivation studies, and confluent approaches to the teaching of subject matter. These studies will be discussed in relation to the BPE paradigm.

A survey of the early pilot programs (prior to 1972) in curriculum development reveals a tendency toward generating curricular alternatives without systematically attempting to assess the effectiveness of these activities or programs on participating students (Stanford, 1972). Such studies as those conducted by Brown (1971), Ambrosie (cited in Stanford, 1972) or Weinstein and Fantini (1970)
all utilize a differentiation of the treatment variable (E) but with no attempt to empirically match treatment to outcome (B) or characteristics of students (P). Though anticipated outcomes (B) of such programs are numerous and in some instances consideration of student characteristics (P) such as learning style variations are discussed (Weinstein & Fantini, 1970) these variables are not systematically researched to determine what, if any, relationship they have to one another.

Similarly, early values clarification research (prior to 1966), was methodologically weak. Though helpful in establishing direction for future research and providing preliminary support for the usefulness of values clarification programs, these early studies were generally unable to establish relationships between programs (E) and their effects (B) (Kirschenbaum, 1974). Furthermore, these early studies were limited as a result of concentrating on a relatively narrow range of treatments and outcome variables. However, the recent trend in values clarification research reveals much greater methodological sophistication and an accordingly greater range of treatment variations as well as outcome measures within and across these studies. Treatments used in these studies have typically included between 10 and 30 hours of a variety of values clarification activities. Often these activities center around personal content, but in addition a number of studies integrate values clarification procedures with the teaching of such subject matter as ecology (Raduns in Kirschenbaum, 1975), earth sciences (Chamberlain, 1971), reading skills (Pracejus, 1974), and drug education (Smith, 1973; Clarke in Kirschenbaum, 1975).
Occasionally such studies contrast the use and effectiveness of two approaches (Raths vs. Oliver) to values clarification (Wilgoren, 1973). Others compare effects of two approaches to addressing some subject matter such as drug education (Smith, 1973) in which one approach utilizes values clarification and the other does not. To this limited extent treatment (E) differentiation exists in the literature. However, the differentiated matching of treatments to population characteristics does not appear to take place.

A wide range of outcome measures are reported among values clarification studies, including measures of attitudes, academic skill level, self concept, classroom behavior, decision-making ability and drug usage. In studies using multiple outcome measures there are occasional examples of differential effects (B) of programs (E) relative to variations in population characteristics (P). For example, Chamberlain (1971) identified differential effects between girls and boys in the teaching of an earth sciences course utilizing values clarification. Such studies, however, do not differentiate objectives to provide for the matching of these objectives with population characteristics.

In summary, research in values clarification, though exhibiting differentiation in each of its B, P, and E components reveals no efforts to systematically match these components in order to achieve optimum effects.

A number of psychological education studies, particularly those emphasizing academic performance outcome measures (Kolb, 1965;
McLelland, 1972) completely lack differentiation of research variables. Yet others, perhaps as a result of the complexity of their design, offer greater potential for differentiation and for matching. For example studies which involve the training of classroom teachers may view performance or attitude of the teachers as the only outcome of training or they may also consider the performance of the students of these teachers as an indirect outcome of teacher training (Berensen, 1971).

Such a design in which both teacher and student outcomes are assessed provides an example of a form of treatment (E) differentiation. That is, by identifying the various learning outcomes of a group of teachers, each teacher's skill level in turn becomes the basis for a differentiated treatment relative to her students. In such a study by Hefele (1971) sixteen teacher trainees were exposed to an "interpersonal process training program." Following this training program, these teacher trainees were then matched to supervising teachers with whom they taught for six weeks. During this time, from the beginning of training through the end of the teaching period, teacher-trainee skill level was assessed on a monthly basis. Also, during the six week teaching period student learning (B) provided data on the effectiveness of the teacher-trainee's style. In this way the training program's differentiated impact on the trainees provided the basis for differentiating treatment in the teaching of students in the six week follow-up period. Further differentiation in this study was accomplished through the use of multiple outcome measures on the California Achievement Tests (reading, math, and
language sections). Finally, not only were the skill levels of trainees scored and correlated with student outcome measures, but the effectiveness of the match between trainee and supervising teacher was assessed at the beginning and end of the working relationship. Several implications for the matching of trainees with supervising teachers were suggested by the author.

In addition to such studies which assess the impact of an experimental human relations training approach, there are a number of research efforts whose purpose is to provide documentation or support for well-known and widely disseminated human relations training programs such as "Tribes" (Gibbs, 1978) or "Magic Circle" (Polomares & Rubini, 1973, 1974).

"Tribes," for example, is a comprehensive psychological education curriculum for elementary school children which incorporates values clarification, confluent strategies, human relations training skills, and self-awareness activities (E) to promote "positive self esteem," improved communication and decision-making skills, a supportive classroom environment and improved academic performance among students (B) (Gibbs, 1978). Several studies have compared classrooms utilizing the Tribes program to those which did not use the program. These studies revealed significant changes for the experimental groups in such areas as attitude toward teachers, self-esteem and social adjustment, school performance and attitude toward school (Gibbs, 1978) as well as intention to use drugs (Horan & Williams, 1975). Most of the evaluation efforts used several outcome measures at once. Also students were generally differentiated by grade level.
and treatments were to some extent varied accordingly. That is, many of the program activities specify a grade level range for optimum use.

These examples of research reflect differentiation of B, P and E variables. However, here again there is no attempt to define particular outcomes for particular students or to systematically match treatments to student characteristics except as broadly defined by grade level. This research format is also typical of similar studies supporting the effectiveness of such programs as the Human Development Training Institute's Magic Circle Curriculum (Isaacson, 1976; Kyle, 1976).

One counter example to this research trend was found in a study investigating the effects of the DUSO Guidance Program on 300 children from grades 1-3 (Koval, 1972). In this study student scores on four outcome measures were correlated with grade level resulting in an interaction effect between one of the outcome measures, "Sense of Personal Freedom" and grade level. That is, the first grade experimental group showed a significant gain on this measure while 2nd and 3rd graders did not. Though these findings were not based on the matching of treatment or outcome to population characteristics, they may be useful in the future in the design of DUSO research utilizing a matching model approach.
Summary

In the preceding discussion, the research literature covering psychological education-related fields has been reviewed relative to a matching model paradigm. This review considered literature from such fields as group psychotherapy and human relations training as well as non-developmental studies drawn from values clarification, confluent education, and assorted curricular projects. Though in general the research literature is limited in its differentiation of B-P-E components, a number of studies were found in which differentiations and/or matching occurred. Such studies typically involved the differentiation of one or possibly two variables, often comparing effectiveness of two similar treatments (Wilgoren, 1973; Hefele, 1971; Smith, 1973), or investigating the relative effect of a single treatment on a differentiated population (Koval, 1972; Chamberlain, 1971; Eisenstadt, 1967). Only a few examples were found (Luke & Seashore, 1966; Abramowitz & Abramowitz, Robach & Jackson, 1974) in which attempts were made to match differentiated treatments to a differentiated population. Even in those cases in which attempts were made to differentiate the population, the variables used were fairly broad (such as grade level or sex) and often not clearly related to the intervention. Furthermore, the studies reviewed in this section included little or no references to any theoretical bases for utilizing a given intervention with a given population. These shortcomings of the non-developmental research literature seem to reflect the view that learning is essentially a function of the
intervention (E-B), and thus individual differences (P) may be ignored.

The present study addresses these limitations in two ways. First, this study utilizes a curriculum which reflects the self-knowledge stage criteria of the two highest self-knowledge stages (see discussion of Self-knowledge Theory in Section II of this chapter, also see Appendix A). In this way the curriculum is developmentally matched to the self-knowledge level of the population consisting of subjects who typically function at these two self-knowledge stages. Second, Self-knowledge Theory is utilized in this study as a means of further differentiating the population by self-knowledge stage in order to determine subjects' relative degree of match to the intervention. This use of Self-knowledge Theory in differentiating the population improves upon the previous research efforts described above in two ways: (1) Self-knowledge Theory provides the theoretical basis for Education of the Self curriculum and goals and so is particularly well suited as a measure of participant match or "readiness" to this intervention. (2) Self-knowledge Theory, in contrast to most non-developmental variables described above, provides for relatively fine differentiations between its stages, each of which is uniquely defined by several specific stage criteria. In these two ways the present study's use of Self-knowledge Theory as a basis for differentiation of the population provides for a more precise and more appropriate match between population and intervention than has been found in the studies reviewed above.
Applications of Structural Developmental Theory to Psychological Education

This section of the review provides a detailed look at how structural developmental theory has been used in psychological education research and practice. As in the previous section of the review, discussions will focus on the extent to which B-P-E components have been differentiated and used in the context of a matching model paradigm. Developmental theories to be explored in this section include Kohlberg's (1969) Moral Developmental Theory, Loevinger's (1976) Ego Development Theory, Selman's (1974) Interpersonal Perspective Taking Theory, Alschuler, Evans, Tamashiro and Weinstein's (1975) Self-knowledge Developmental Theory, and Hunt's (1974) Conceptual Level Theory. The degree to which each of these theories are covered in this review varies according to the extensiveness and relevance of the available research on each theory. Because of the considerable range of moral developmental applications to psychological education, the discussion of this theory is particularly extensive. The review of developmental theory applications will begin below with a (detailed) discussion of Moral Developmental Theory.

Moral Developmental Applications to Psychological Education

Kohlberg describes moral development as a series of six stages, each of which differs qualitatively from the preceding stage (Kohlberg, 1969). The stages occur in the following invariant sequence: stages 1 and 2 are referred to as "preconventional," focusing on
physical consequences, avoidance of punishment and the satisfaction of one's needs; stages 3 and 4 are characterized by conventional thought, in which concern for social norms and order, and respect for authority are prevalent; stages 5 and 6, the post-conventional stages, are based on the acceptance of mutually decided societal standards and universal ethical principles as the basis for moral judgments (Kohlberg, 1969).

Of the developmental theories reviewed in this study Kohlberg's Theory of Moral Development has been the most widely applied to psychological education efforts. Researchers and practitioners have devised numerous forms of interventions and equally varied research designs to produce an impressive array of differentiated variables and relationships viewed from the B-P-E perspective. Accordingly a number of studies have as a central purpose the identification of curricular treatment components which are most facilitative of developmental growth. In many cases these treatments are designed according to the specific developmental needs of populations. In this way they are matched to population characteristics (P). The following discussion will consider the variety of efforts drawn from moral developmental research used to match treatment components (E) to population characteristics (P).

Matching Interventions (E) to Population Characteristics (P) in Moral Developmental Studies

The most commonly used approach to matching interventions to population characteristics found in moral developmental studies
involves the principle of "+1 modeling." This principle is based on the assumption that a student's development can be promoted through the exposure to reasoning processes one stage above the student's present level. Typically in these studies the classroom teacher assumes the role of facilitator with no curriculum except for the discussion of moral dilemmas. The teacher provides a +1 model as she encourages discussion and contributes responses which are one developmental stage above the current discussion level. Such an approach provided the basis for the early pilot studies on moral developmental theory (Blatt, 1969; Blatt & Kohlberg, 1975). A similar approach involved the use of role-play in which 7th grade boys were exposed to different levels of moral developmental thinking (Turiel, 1966). One group of students received advice about hypothetical moral dilemmas that was one stage below their level of reasoning (-1), another group received advice from one stage above (+1), and another group from two stages above (+2). The study revealed differential effects due to these treatment variations, with the +1 treatment having the greatest effect as hypothesized. Though studies utilizing this matching principle have generally produced positive results (Lockwood, 1978) the +1 modeling approach has been criticized as a matching strategy. Rest (1974) notes that in such studies where students are heterogeneously grouped the +1 modeling that occurs is only occurring for a fraction of the students at any given time. This is because each teacher's response can only be at one stage level at any time, and with students at varying stages the teacher's response
cannot be one stage above all of the students' simultaneously. Rest further suggests that most of the +1 modeling comes from students in the discussion group. However, if this is the case then an equal amount of -1 modeling is taking place for these students as well. In addition to these limitations of +1 modeling with heterogeneous groups Rest points out some other practical considerations ". . . is it really possible for a teacher to code a child's statement, to decide what stage is above it, and to compute a response all in the time farme of conversational exchanges?" (ibid., p. 249). He suggests that it is unrealistic to expect a teacher to be able to spontaneously converse at a level one stage above a student's.

Such criticisms as these point out the limitations of +1 modeling as an effective strategy for matching developmental characteristics (P) with treatments (E) within the context of moral dilemma discussion groups. Though +1 modeling can be an effective component of a moral developmental program, further research is needed to determine the specific effects of +1 modeling under different treatment conditions in order to identify when, how and with whom such an approach can best be used to promote developmental growth.

Another element involved in the matching of moral dilemma interventions to student characteristics is suggested by the curriculum development efforts of Peter Scharf (1978). According to Scharf "a good match between a dilemma and a group of students includes an assessment of the students' moral stage and the types of issues which genuinely interest and excite them" (ibid., p. 77). For example dilemmas most appropriate to fifth and sixth graders should involve
conflicts that reflect stage 2 and 3 issues, in particular conflicts concerned with relationships with family, friends or pets. Older students at higher stages will show greater interest and involvement in conflicts between moral principles and the law or social conventions (for example, is stealing ever justifiable?).

It has been proposed that the content of moral dilemmas used in discussion groups can have an effect on their "success." Though this view seems plausible and is further supported by efforts to use real-life dilemmas (Scharf, 1977; Rundle, 1977), empirical evidence is still needed to substantiate this hypothesis.

A number of studies have shown that the discussion of moral dilemmas in the classroom can effect students' level of moral development (Blatt, 1969; Blatt & Kohlberg, 1973, 1975). Typically these studies rely on the principle of +1 modeling to provide for a match between the treatment and the population. In order to provide for an appropriate match for all members of a heterogeneous population, a differentiation of the treatment (differentiated by developmental stage) is necessitated. Each intervention, theoretically, can then be matched to a particular population on an almost individual basis. A number of "developmental" studies, however, do not provide for differentiated treatments. The match of treatment to population in such instances is of a more general nature. The treatment is matched a priori to the general developmental characteristics of the population. It is assumed that the population will generally cluster within a narrow developmental range and that a program which is "developmentally based" can thus be designed to "fit" the population.
Exemplifying this approach to matching are a number of programmatic curricular efforts, including the development of Kohlberg's "Just Community School" concept. The use of matching as a means to promote development is essential in this institutional approach to moral development. However, rather than relying on the use of hypothetical dilemmas, modeling, and role taking, these "school programs rely primarily on the principle of matching individuals' reasoning and action to the structure of a particular social world" (Reimer & Power, 1980, p. 304). This form of matching is based on Piaget's view that cognitive development occurs naturally as a means to help the individual adapt to her environment (Piaget, 1967). The work of Scharf (1974) and Hickey (1974 cited in Rest, 1974) with prisoners suggests that certain institutional norms may limit moral developmental reasoning. On the other hand, Reimer's work (1977, cited in Reimer & Power, 1980) with a kibbutz school in Israel shows that certain institutions encourage higher-stage moral reasoning among individuals. Thus, it was assumed that through the creation of an alternative school program such as the Just Community School the adolescents' "world" could be structured in a way which would promote the student's development. Operating in a world organized around the principles of democracy and justice it was assumed that students would be motivated to "construct" more adequate modes of reasoning and action to "fit" that environment (Reimer & Power, 1980, p. 304).

In these alternative school programs, the Cluster School for example, students and staff use a just (democratic) procedure in the form of a "town meeting" to discuss real life moral issues and arrive
at just decisions. These schools also promote "communal relations" among students and staff (norms of trust, intimacy, participation and collective responsibility). Moral development is promoted through group interaction and decision making utilizing the following norms: exposure to cognitive moral conflict, role-taking, consideration of fairness and morality, exposure to the next higher stage of moral reasoning, and active participation in group decision-making (Wasserman, 1980).

Though the use of these principles has been shown to promote moral development (Wasserman, 1980) they are cited by Kohlberg as conditions necessary for moral growth regardless of the individual's stage level. The use of these principles therefore has not been specifically designed or matched for the particular populations of these alternative schools such as the Cluster School or the School-Within-A-School (Brookline, Mass.). However, assuming that an effective match in moral developmental treatment is achieved through +1 modeling, there is evidence that these alternative school programs are well matched to a portion of their population both in terms of broad educational practice (E) and objective (B). In particular Kohlberg emphasizes the importance of providing experiences designed with a "fourth-stage citizenship-role orientation, as well as for developing some awareness of our fifth-stage principles of constitutional democracy" (Kohlberg, 1980, p. 35). These stages (4 and 5) provide most appropriate goals as well as interventions for students entering the program at stages 3 and 4. The available research suggests that students in these programs enter at stages 2, 3, and 4.
For those students at stage 3 and 4 but not those at stage 2, the Just Community School programs therefore appear to utilize at the institutional level a +1 modeling approach to the matching of treatment to population. It is not clear in a review of relevant research whether this partial matching is intentional or simply a necessary bi-product of developmental studies involving heterogeneous populations.

The research data that is available on these programs suggests that students enrolled are showing greater than expected moral developmental gains. Two thirds of the students advanced more than the average 1/3 stage (Higgins, 1980). In a preliminary report by Mosher on the School-Within-A-School program, he reports that students entering at stage 4 showed no growth, possibly indicating a "ceiling" for this form of intervention (Mosher, 1980).

This finding suggests that these programs may be emphasizing stage 4 functioning and so may be most appropriately matched to stage 3 participants. Further research is needed to gain a better understanding of the curricular elements involved in these programs and the relative and differential effects they may be having on different populations.

Several studies, particularly those concerned with adolescent moral development have drawn upon developmental theory as a basis for matching treatment to population at a general level by providing guidelines for curriculum development (Alexander, 1980; Mosher & Sprinthall, 1971; DiStefano, 1980; Paolitto, 1980). One such study by Ann DiStefano (1980) evaluated the efforts of a one-semester curriculum utilizing interpersonal and sexual dilemmas for adolescents in a democratic alternative school program. The curriculum was based on Kohlberg's
Moral Developmental Theory, Loevinger's Ego-developmental Theory, Byrne's Role-taking Theory, and Jeanne Block's Sex Role Development theory. In addition, these theories were used to suggest a "process of identity formation" unique to adolescents and central to the specific process of adolescent sexual identity. Subsequently, the general goals of the curriculum were based on this "process of identity formation" as well as on the developmental theories cited above.

Using the Kohlberg Moral Judgment Interview as a basis for measuring moral development, the experimental group showed gains of almost one-half stage (42 MMS points). Similar gains were found on a measure utilizing sexual dilemmas only. Due to the relatively strong gains (one-fourth stage) also experienced by the control group, it was concluded that the common school experience may have accounted for half of the gain of the experimental group.

In addition to these results, DiStefano also reports on the results of a related study (Gilligan et al., 1970) in which it was found that high school students' moral reasoning level on sexual issues was lower than their reasoning level on standard Kohlberg moral dilemmas. These findings demonstrate the value of differentiating treatments according to content areas as well as differentiating objectives for students based on their developmental level relative to a particular content area such as sexual issues. Unfortunately, these differentiations were not incorporated in this study, though the use of multiple outcome measures was incorporated to some extent.
The above review of moral development research illustrating the matching of interventions to populations on the basis of moral development stage illuminates a number of unresolved problems for developmental research. To begin with, though several studies have shown that +1 modeling may be an effective matching principle in promoting stage change (Turiel, 1966; Blatt, 1969; Blatt & Kohlberg, 1974) it is not clear how such an approach works with heterogeneous groups as Rest (1974) points out. The problems of consistently providing a +1 model in a moral dilemma discussion group appears most difficult to overcome. Furthermore, for programs which involve a greater variety of curricular activities such as the curriculum evaluated by DiStefano (1980) the likelihood of providing +1 modeling experiences for the majority of students seems remote. Finally, efforts to match a curriculum to a population on an a priori basis as described in relation to the Just Community School approach also seem to largely ignore individual differences and needs.

These limitations of past research are not easily addressed. The present study, however, may be helpful in improving upon some of these aspects of the previous research. For example, though +1 modeling is not necessarily an aim of the Education of the Self curriculum, the program allows individuals to work at varying developmental levels on self-selected topics. This type of individualization of the curriculum provides participants with opportunities to push themselves appropriately, and typically to a +1 level. That is, the content of the curriculum encourages inquiry at the highest self-knowledge stage. For those who are unable to effectively function at this stage, they
should tend to focus most of their efforts at the next highest stage. Because most of the participants in the course have self-knowledge capacities within this two-stage range they will generally be confronted with experiences either appropriate to their stage or one stage above theirs. To the extent that students "push themselves" in accepting the challenges afforded by stages higher than their own, they may experience considerable +1 modeling. In this way the curriculum itself may provide a useful vehicle for ensuring +1 modeling for all students. Furthermore the present study attempts to improve upon the a priori matching discussed above in relation to Kohlberg's Just Community School approach. In contrast to general matching, students' self-knowledge level will be pretested in order to determine for which subjects the intervention is specifically matched and for which it is unmatched. It will thus not be assumed that all students are equally matched to the intervention as in previous studies cited. As a result of differentiating students (who otherwise might be assumed to be generally matched to the intervention) it will be possible to identify differential effects of the intervention related to developmental differences among the population. Such findings can be particularly useful in determining why certain programs appear more effective for some populations than others. Hopefully answers to these questions may be of potential use to both practitioners and researchers in efforts to improve upon the effectiveness and appropriateness of psychological education interventions in general.
Studies Comparing Treatments in Moral Development Research

The above discussion has focused on attempts to match moral development interventions to populations according to developmental stage criteria. The following discussion will consider the use of differentiated treatments in studies concerned with differential effects (B) in moral developmental research.

Several moral developmental studies have compared the effects of two or more strategies to assess relative effectiveness of approaches (Dozier, 1974; Blatt & Kohlberg, 1974; Harris, 1976; Dowell, 1971). One such study (Blatt & Kohlberg, 1974) was designed to research the effects of plus-one modeling and teacher-led discussions in a moral dilemma discussion group. Two types of interventions were compared. One treatment involved students in a traditional moral dilemma discussion group (facilitated by Blatt). The other treatment followed a moral dilemma discussion format but with no systematic leadership. The directed groups showed significant gains relative to most leaderless groups and control groups. Follow-up testing, a year later revealed that these gains were maintained. According to Kohlberg (1980), however, some of the leaderless groups showed as much growth as the Blatt-led groups. Those that did not show growth he notes were groups without stage mixture, generally at relatively low stages.

Both the Dozier (1974) and Harris (1976) studies compared a direct discussion approach to variations of the "Deliberate Psychological Education" approach (Mosher & Sprinthall, 1970, 1971 — see Ego Development section). Dozier (1974) compared results of one group
exposed to direct discussion and +1 matching to results of a second group in which students were encouraged to express their feelings on personal and social issues and develop awareness of self and others, for example, through role-playing and discussion. There was no significant difference between gains of the two treatment groups with both groups showing average gains of 1/3 to 1/2 stage (increase in MMS's of 40 points). However, both groups showed a significant advance over the control group.

Harris (1976, cited in Higgins, 1980) compared the effects of two "values education" courses utilizing the direct discussion approach to varying degrees. One used direct discussion of dilemmas throughout the semester. The other group, labeled the "psychological education group"* received empathy skills training and communication skills training for the first half of the semester, and direct discussion of moral dilemmas for the second half. Results of the study showed for both groups a significant and equal degree of upward stage change of 46 MMS points and 47 MMS points respectively. However, the "psychological education group" gained 41 of its 47 points during the moral discussion phase in the second half of the semester while the direct discussion group advanced 24 MMS points in the first half and 22 points in the second

*The term "psychological education" is used in this study principally to refer broadly to the variety of curricular approaches described in Chapter I as promoting personal learning and psychological competence. At the same time the term is used as a label for a particular educational approach most often associated with the "Deliberate Psychological Education" model developed by Mosher and Sprinthall (1970, 1971). In order to differentiate the use of the general term from the specific curricular approach, the term "psychological education" will appear in quotations when it is being used as a name for a particular approach or program.
Based on this differential outcome Harris suggests that the "psychological education" treatment produced "conditions for optimal development." In a follow-up criticism however, Lockwood (1978) notes that though Harris' data are suggestive of an effect they do not warrant the "claim of a precondition effect" (p. 356).

Though the results of the Harris study suggest that "psychological education" programs may have limited value in promoting moral development without the use of direct moral discussion, several studies contradict these findings. In addition to Dozier's (1974) research cited above, Erickson's (1975) study of a psychological education course for women, and Sprinthall's (1976, cited in Higgins, 1980) study of a high school counseling course, both reported a significant moral change score for experimental groups. Furthermore in Lockwood's (1978) review of eleven moral education programs he concludes that studies utilizing the direct discussion method as well as studies based on "psychological education" or self-awareness approaches typically report equal gains of one-third to one-half stage increase in moral development. These gains, however, appear to occur for individuals and groups principally at stage two and three. Neither approach "appears effective at stimulating reasoning beyond stage four" (Lockwood, 1978, p. 361).

In summary it appears that both the direct discussion and deliberate "psychological education" approaches are capable of promoting moral development. There is some evidence that direct discussion is a more reliable method. Neither approach has effectively been used to promote development through stage four. Further work is needed in this area.
Based upon some of the early findings of the effects of moral education within a democratic (institutional) setting (Wasserman, 1976) and the growing conviction among theorists that dilemmas which are real and vital to students will have a greater impact than hypothetical ones (Stuhr & Rundle, 1980) a study was designed by Rundle (1977) to determine the comparative effects of a moral education curriculum for an elementary school classroom. This study involved three fifth grade classrooms: one used the discussion of real moral dilemmas within the context of a "democratic" classroom setting; a second used the traditional approach to the discussion of hypothetical dilemmas; the third was the control group which received no moral discussion treatment. The study revealed differential effects for the two experimental groups, with students in the democratic classroom group showing average gains of 1/2 stage while the traditional group and the control groups showed no significant change.

Because two variables (use of real dilemmas, and democratic process) were combined in the democratic classroom to differentiate this treatment from the other experimental treatment, it is not possible to determine whether one of these two curricular components or the interaction of the two affected moral developmental change of the students. In addition Rundle reports (Stuhr & Rundle, 1980) that the same 5th grade curriculum in classroom democracy produced no significant effects in 1975 when implemented in a different classroom which was not self-contained. He cites the following probable reasons for the failure of the earlier effort: The class was taught by five or six teachers who were perceived either as authoritarian or permissive by the
students. There was no evolving group identity among the students. Rules were poorly defined and inconsistently enforced. There was an imbalance between student autonomy and teacher authority which precluded a cooperative and collaborative democratic process. Stuhr and Rundle conclude "classroom democracy demands an environment where children feel secure, the teacher is trusted, and where caring for others is a value" (1980, p. 246).

In summary it can be assumed that a number of such factors typically contribute to the success as well as to the failure of curricular efforts in moral education in particular and psychological education in general. The identification of these factors is essential to the development of programs which are appropriately matched to the needs of populations.

Such studies as those by Grimes (1974) and Stanley (1979) provide additional examples of attempts to identify factors which contribute to the success of moral education interventions (E). In these two studies parent involvement in discussion groups was shown to have an effect on the moral development gains of the children in these groups. In Grimes' study mothers and their 5th and 6th grade children met together to discuss hypothetical and real dilemmas. The average stage change for this group was 1/2 stage compared to 1/3 stage for the all-student comparison group, and no change for the control group. Stuhr and Rundle speculate in regard to these findings that "the mothers extended the treatment into family life and that their presence motivated the students to more fully participate in Grimes' curriculum"
Similarly Stanley (1979) reports on the effect of including both parents and their adolescent children in a course involving communication skills and an approach to family meetings emphasizing fairness and democracy. In addition to the parent/adolescent group there was also an all-parent group and an all-adolescent group included in the study. Every student in the parent/adolescent group showed a gain of 1/3 stage while the other two groups showed no significant gains.

These findings further testify to the important role in moral and psychological education played by the family. Of perhaps even greater significance here is the implication in these studies that parents "can be helped in this role as the primary moral educators of children" (Stanley, 1979, p. 342).

In addition to studies described above which utilize moral dilemma discussions and a variety of "psychological education" variations, several studies have assessed the effects of social studies curricula on the moral development of students. Strom (1980) has developed a curriculum on the Holocaust which has been implemented in two junior high schools in Brookline. The curriculum unit included films, interviews with Holocaust survivors and discussion of students' feelings and reactions. Several developmental measures such as moral development, ego development and interpersonal awareness as assessed by Selman (1974) were used to assess outcomes. Only in the interpersonal awareness dimension was there significant growth (an average movement of stage 2 to 3) for the students taking the course.
Higgins (1980) reports on a project of the Harvard Center for Moral Education in which two moral education approaches to the teaching of history were compared. In the first, the instructor included the use of role-play of historical situations. In the second, historical and hypothetical direct moral discussions were used. Neither class showed any significant moral development gain.

In sum, efforts to date have suggested that the use of academic subject matter as a vehicle to promote moral development may be of limited potential relative to the more direct methods of moral discussion or the "psychological education" programs described above.

A number of studies have been cited above in order to illustrate the differentiation of treatment variables (E) in moral development research. In these studies several treatment variables were differentiated in efforts to determine which kinds of treatment variations lead to differential effects. Such variables were differentiated as degree of teacher involvement, amount of direct moral dilemma discussion, sequence of approaches, degree of student autonomy or classroom democracy, and level of parent involvement. These variables, once differentiated, were generally shown to influence outcomes. In this way research involving the differentiation of treatment variables has contributed to the identification of factors which influence program effectiveness.

Though the present study does not incorporate the use of differentiated treatments, it does provide for the investigation of a number
of factors which may influence learning outcomes. Such variables as participants' previous experience, reasons for enrolling in the course and participants' age will be correlated with outcome measures. In this way it is hoped that research findings from the present study may support the above efforts to identify variables which contribute to more effective matches between interventions and populations.

Applications of Ego Development Theory to Psychological Education

Another developmental theory used as a basis for a number of psychological education programs and research efforts is the Ego Development Theory of Jane Loevinger (1976). This theory though structurally similar to Kohlberg's is broader conceptually, incorporating such aspects of personality development as impulse control, character development, interpersonal style, conscious preoccupations and cognitive style. Loevinger's theory describes seven stages and three transitional phases each of which reflects a qualitatively different orientation for the assigning of meaning to experience. As in the case of the other theories reviewed in this section, the stages of this theory are invariantly and hierarchically ordered with each stage progressively increasing in complexity. The stages proceed in the following order: presocial, symbiotic, impulsive, self-protective, self-protective/conformist transition, conformist, conformist/conscientious transition, conscientious, conscientious/autonomous transition, autonomous, integrated (Loevinger, 1976).
Possibly the most extensively documented curricular effort utilizing ego development theory and measures is Mosher and Sprinthall's "Deliberate Psychological Education" model (DPE) (Mosher & Sprinthall, 1970, 1971). The DPE model utilizes a seminar practicum format in which students participate in some form of field experience (e.g., peer counseling, working as nursery school aides, tutoring, etc.) and also regularly meet in a seminar to discuss psychological principles involved in their work. Through this seminar students are encouraged to personalize their learning by reflecting on their roles and responsibilities and the personal meaning of their experiences, and by expressing feelings and making personal decisions.

The goal of the Deliberate Psychological Education curriculum is the promotion of "personal development." In order to accomplish this goal, Mosher and Sprinthall cite several developmental theories in addition to Ego Development Theory used in the planning of this program and the identification of general curricular aims. These developmental theories are utilized in relation to the unique developmental characteristics of an adolescent population. For example Mosher and Sprinthall cite Piaget in describing new thought processes available to the adolescent. Prior to this time students are not able to think abstractly, conceive of self and the future in probabilistic terms, or change hypotheses about self or the world as new information is presented. According to Kohlberg's Moral Developmental Theory adolescents are in a state of transition, typically moving from a "pre-conventional" moral reasoning level to a
conventional level."* In addition, Erikson's (1968) view that adolescence is a period of self-definition and identity formation is also used to support the timeliness of the Deliberate Psychological Education Program. Elkind's (1967) view of the re-emergence of ego-centric thought in adolescence is mentioned to support the need for a program capable of moving the adolescent "from the limits of ego-centric thinking to a more differentiated and integrative mode" (Mosher & Sprinthall, 1971, p. 379).

In addition to attempting to utilize these specific developmental theories in the planning of their curriculum, Mosher and Sprinthall also base their program on the general developmental principle that development is fostered through interaction involving:

1. active thinking and active doing,
2. exposure to experiences which are dissonance producing,
3. opportunities for social role-taking.

Using these developmental guidelines Mosher and Sprinthall have attempted to design a program matched to the developmental level of their population. Accordingly, opportunities for considering values and personal self-reflective questions are a part of the curriculum. By incorporating new, social role-taking experiences and encouraging

*It should be noted that there is some discrepancy of views as to what the moral development research reveals regarding adolescents. Rest (1974) cites Kohlberg's research as supporting the Deliberate Psychological Education curriculum for adolescents, since this period of adolescence involves a shift from "conventional" to "principled" autonomous morality. Perhaps the discrepancy of views is actually over what age group constitutes adolescence. In any event this confusion should be cleared up if a curriculum is to be based on one of these two "developmentally based" views.
students to assume responsibilities for self and others, the curriculum further expands the students' "experience table" (Sprinthall, 1972, cited in Rest, 1974).

Results of studies (1970, 1971) show that students in the DPE experimental course made significant moral development gains of 1/3 stage as well as significant ego development gains as measured by Loevinger's ego development scale (pretest 3.2, posttest 4.4, p<.001). Counseling skills also showed significant improvement.

Though the developmental principles cited can be used as a general justification for the design and implementation of this course for adolescents, Mosher and Sprinthall's DPE program cannot be regarded as developmentally matched to its population according to Rest (1974). Rest bases this criticism on the absence of several elements which he suggests are essential to a developmentally matched curriculum:

1. Pre-treatment determination of the developmental level of the population.
2. Use of stage characteristics of participants' developmental levels as a basis for the day-to-day planning of interventions most appropriate to participants' needs.
3. Detailed justification for specific experiences, the order in which they are undertaken, and the ways in which they are matched to the students' developmental level.

In the absence of meeting such criteria, Rest contends "any program which makes self-identity its focal content can claim to be just as grounded in developmental psychology as Sprinthall and Mosher's (ibid., p. 253).
Typical of a number of related studies involving "deliberate psychological education" programs is the use of an assortment of curriculum components collectively intended to promote the ego development of children and adolescents (Higgins, 1980). Several such studies also incorporate the use of moral discussions (Sullivan, 1980; Arredondo-Dowd, 1978) but with no attention given to the differential effects attributable to these treatment components. For example Sullivan (1980) taught a year-long social studies course to high school students involving five components: personal introductions, moral discussions, counseling and empathy training, moral psychology and philosophy, and a practicum experience involving students as moral educators. Results of the study revealed average gains of one stage in ego development and one-half stage in moral development. Control groups used in this study showed no change on either measure. No attempts were made to isolate developmental characteristics of students or treatment components which may have accounted for some of these developmental gains. Sullivan did, however, determine that "active participation" in the discussions and practicum appeared to contribute to student development on both measures. He notes that "everyone who advanced more than half a stage on the Loevinger ego development measure led moral discussions" and was actively involved in the program (Sullivan, 1980, p. 182). This finding, though not used in the Sullivan study for predictive purposes, suggests some possible areas of research for future investigation into the identification of (P) variables which may predict differential effects of treatments.
A similar curriculum designed to reduce prejudice was developed by Alexander (1980). This curriculum included the same components as did the Sullivan curriculum with the exception of the peer counseling phase. During the seminar component students were led in discussions about prejudice. These discussions involved real dilemmas drawn from personal experiences as well as hypothetical dilemmas based on films presented involving issues of prejudice.

Results of this study revealed a mean increase among the experimental subjects of one-third stage (28 MMS points) in moral development and one-half stage (from stage 2(3) to 3) in ego development. Again, with the standard exception of attempts to promote +1 modeling during discussion of dilemmas, there appears to have been no differentiation of treatments or objectives for subjects in this study. Alexander did, however, report a potentially useful relationship to be explored in further research. His findings "tentatively supported speculation that moral stage and ego stage were related to prejudice" (p. 142). In particular his data revealed an inverse relationship between moral stage scores and scores on prejudice measures. This relationship may be useful in the search for (P) variables which can be matched to the treatment to enhance program effectiveness.

This review of ego development studies revealed few examples of differentiated or comparative treatments. One such study (Hunt, 1977) was found however and will be cited here not only because it involves a comparison of treatments but also because it provides an example of an attempt to utilize developmental theory in defining goals (B) of a teacher education program.
Hunt's teacher education curriculum emphasized the development and practice of counselling skills through role-play and peer counselling situations. The goal of this program was to deliberately promote the ego and moral development of pre-service teachers. Three groups and three corresponding treatments were used in this study. One experimental group labeled the "curriculum 1" group received the highest level of training including counselling skills, practicum, seminar, and traditional educational psychology content. A second experimental group labeled the "curriculum 2" group participated in a modified psychological education curriculum identical to "curriculum 1" except it included no counselling training. The third group serving as the control group received no counselling training, no practicum, and no seminar, and instead participated in the standard introductory psychology class.

The results showed that a significantly greater proportion (p<.025) of students in the "curriculum 1" group than in the control group revealed ego development gains. The comparative treatment also resulted in somewhat significant gains as a greater, though not significantly greater (p<.15) proportion of "curriculum 1" students than "curriculum 2" students showed gains in ego development. The author of the study also notes that "curriculum 1" students showed a post-treatment "increase in post-conventional moral maturity" (stages 5 and 6). Hunt concludes his report by suggesting that his curriculum promotes higher levels of functioning in both moral and ego development.
Though Hunt's comparative treatments did result in differential effects, no efforts were made to determine whether student characteristics in any way contributed to these differences in outcome.

As was found in the majority of studies utilizing moral development measures, most ego development studies reviewed did not appear to incorporate matching principles except in the most general sense. Studies typically used ego development primarily as an outcome measure. In some cases programs and curricula were loosely based upon developmental theory. However, in general these studies lacked deliberate attempts to match the developmental level of the participants to the intervention in any way. For example in a study by Erickson (1975, 1977) 10th grade female students were trained in interviewing and communication skills as part of a course entitled "A Study of Women Through Literature." The course successfully promoted ego development as measured by the Loevinger scale. The results of the study revealed a gain of one-third a stage on both ego development and moral development measures. A one year follow-up study further indicated that these gains were maintained. Cognetta (1977) designed a study involving high school students in a "cross age teaching model" utilizing the Mosher and Sprinthall (1971) seminar/practicum format. At the end of the course results revealed significant gains for students on the Loevinger ego scale. Rustad and Rogers (1975) taught counselling skills to 11th and 12th graders using a similar format. In all three of these studies opportunities for interaction and student role playing were designed to stimulate
development. In all of these studies gains in ego and moral development were significant to the .05 level of significance.

As Rest notes, however, these studies do not adequately apply the principles of developmental theory to the extent that the interventions are not matched to the developmental level of students nor is the day-to-day planning and sequencing of curricula based on developmental stage criteria. The only sense in which these studies can be said to be developmentally based is in their emphasis of such procedures as role-taking which is at best a general rather than a specific application of developmental theory. Though Rest's criticisms accurately represent the majority of ego development studies, three studies (Blasi, 1976; Warren, 1969, 1976; Grant & Grant, 1959) were found which do utilize some form of matching and which are based in developmental theory in more than a general sense.

Blasi (1972 in Loevinger, 1976) researched the development of sense of responsibility among sixth grade students. He hypothesized that training matched to students' ego developmental level (+1 modeling) would result in greater gains for these students than training unmatched (at equivalent and +2 stages of ego development). To test this hypothesis, students were grouped according to their ego development level and subsequently presented with dilemmas to be role-played with other students at equivalent, +1, and +2 stages of ego development. The results of this study while not confirming his hypothesis revealed that students exposed to +1 and +2 conditions showed gains in ego development while those exposed to their own level did not.
In a study by Warren (1969, 1976) youthful offenders under the authority of the state of California were matched to treatments according to the interpersonal maturity level (a developmental level similar to ego level; see Sullivan, Grant & Grant, 1957) of the offender. Treatment plans as well as juvenile justice workers' styles were matched to the participants' level. Success of this program was measured not by developmental growth but by the recidivism rate of this population. Results revealed that the recidivism rate decreased significantly for those involved in matched programs.

Grant and Grant (1959 in Ziff, 1979) studied the effectiveness of matching supervisory teams to delinquents in the navy who had been categorized as either high or low ego level. Results showed that subjects responded most positively to supervisory teams matched to their level of ego development. This finding supports the assumption that effectiveness of client/therapist relationships may be enhanced through the use of ego level matching. Such a use of Ego Development Theory as a basis for a matching model involving therapeutic approaches has been investigated by Clifford Swenson (Loevinger, 1976). Swenson suggests that the most appropriate therapy for a given patient might be the therapy most closely related to the patient's ego level. Thus "organic and manipulative" therapies such as behavior therapy might be best suited for patients at lower ego levels, while insight therapies such as psychoanalysis may be more effective for patients at higher ego levels. Though this matching model approach appears promising, no empirical data are available at present to support this view.
A range of curricular programs and research efforts in part based on Ego Development Theory have been reviewed. A number of these programs have been loosely organized around Mosher and Sprinthall's DPE model. Though such programs have included a rich assortment of curricular components, the specifics and sequencing of these components appear to lack a clearly identifiable developmental rationale. These programs are only loosely based on developmental theory (like the Kohlberg Just Community School concept) to the extent that they draw upon general developmental principles (e.g., emphasizing interaction) and utilize curricular programs geared to the general developmental needs of a population. The use of matching in these programs is accordingly limited.

A few examples (Blasi, 1976; Warren, 1969, 1976; Grant & Grant, 1959) utilizing differentiated treatments in the matching of treatments to population were found however. Of these, only the study by Blasi (1976) represents a matching model application within an educational context.

The post hoc differentiation of (P) characteristics was evidenced to some extent by the work of Sullivan (1980) and Alexander (1980) who respectively found that ego development was enhanced by "active involvement" in an experimental program and that ego stage is inversely related to prejudice.

Certainly much groundwork has been laid for matching model research based on Ego Development Theory. Yet the majority of the existing studies fall short of an adequate use of a matching model paradigm.
The present study addresses some of the limitations of the ego development research by attempting to incorporate the use of a matching model approach in the investigation of differential effects of a comprehensive developmentally based psychological education curriculum. In contrast to the DPE model, whose curricular content is not clearly related to a developmental theory, the Education of the Self curriculum specifically reflects in its content the stage criteria of the Self-knowledge Theory. The use of Education of the Self in the present study is accordingly capable of partially addressing the Rest criticisms (discussed on p. 50) in relation to the DPE model. That is, to some extent Education of the Self provides a sequence of experiences and a procedure for "processing" them (the Trumpet — see Appendix A) which insures that experiences are generally matched to student developmental levels and can be justified according to Self-knowledge Theory. In addition this study also addresses Rest's first criticism (see p. 50) of DPE research regarding the lack of a pre-treatment determination of the developmental level of the population. For in the present study, pre-treatment self-knowledge level will be assessed by two different instruments.

Finally, most studies reviewed in this section did not deliberately attempt to match the intervention to the population in any way. The present study matches the intervention to the population on the basis of self-knowledge level. Data on matched and unmatched populations are then analyzed separately to establish whether or not differential effects exist.
Applications of Selman's Interpersonal Perspective Taking Theory to Psychological Education

Robert Selman's theory of interpersonal perspective taking has been described as a "valuable link between moral and ego development" (Loevinger, 1976). It is a stage theory which is particularly well suited for research involving young children due in part to the degree of delineation of its early stages and to the assessment techniques and measures used which are appropriate for children as well as for adults. The theory describes six stages of reasoning about interpersonal relations, particularly in relation to the ability to take the perspective of others. Level 0 is egocentric. Level 1 is subjective perspective taking, typical of early elementary school children. Level 2 is self-reflective perspective taking. Level 3, third-person perspective taking, is characteristic of the preadolescent child. Level 4 involves qualitative considerations of persons and relationships such as depth and complexity. Level 5, Selman's highest stage, incorporates symbolic interactions in the individual's conception of others and relationships.

The use of matching in studies involving Selman's perspective taking theory is limited. However, some of the same principles of matching found in studies cited earlier can be identified in these studies as well. For example, Selman and Lieberman (1975) involved second graders in a curriculum incorporating moral dilemma filmstrips, discussion, role-playing and debate. The matching principle of +1 modeling was used as teachers attempted to create dissonance with the students' present level of thinking. In addition interventions
were differentiated on the basis of teacher background and experience with cognitive developmental approaches. Though no differences were found between groups of students taught by teachers with varying levels of experience, a factor that did appear to differentiate outcomes was the motivation level of the teacher. Results of the study were assessed using a measure of intentionality rather than moral or interpersonal perspective level. In both posttests (p<.012) and follow-up tests (p<.001) experimental groups showed significant gains over control groups. These gains indicated that the experimental S's became "more socially aware of the other's ideas and better able to integrate other's thinking and valuing with their own" (ibid., p. 716).

In a similar study with 2nd and 3rd graders Cooney (1977) used 16 sound filmstrips developed by Selman and Kohlberg covering a wide range of interpersonal dilemmas. These filmstrips were presented and then used as a basis for role-play and debate by the children. In this study the matching principle of +1 modeling was complemented with the general developmental principle that development occurs as individuals actively construct their views of the world. Though preliminary results revealed no significant changes in either (1) social perspective taking structure or (2) interpersonal conceptions, Cooney utilized additional outcome measures to substantiate program effects other than stage changes. These measures revealed greater intentionality, greater attention to interpersonal aspects of situations and increased group interaction among students in the experimental group. Cooney suggests that though stage change did not occur, the interventions "tended to produce broader surface application" of the present
stage. Collins (1977) in a review of Cooney's research notes the importance of this study in establishing a precedent in developmental research toward the use of measures which take into account stage elaboration as well as stage change.

In addition to early elementary school applications of Selman's theory, Paolitto (1975) describes an attempt to promote moral and perspective-taking development among adolescents. This study also utilizes matching principles in the design of the intervention. Paolitto draws upon the theories of Piaget, Erikson, Kohlberg, and Selman in the planning of his curriculum for early adolescents. Erikson's theory is used to show the early adolescent's need to become involved in activities which "fulfill the sense of industry" (feelings of mastery, competence and self-confidence) (Paolitto, 1980, p. 206). Piaget's theoretical view describes the early adolescent's transition to formal operations. Kohlberg is cited as identifying the period of early adolescence as the beginning of the transition from preconventional to conventional reasoning marked by the development of a "reciprocal role-taking ability." Selman (1971) adds to the symbiosis of moral and social-cognitive development by demonstrating that development of perspective in social-cognitive development precedes perspective taking in moral development. In addition, according to Paolitto, Kohlberg has suggested additional principles to use in matching role-taking experiences most likely to promote stage movement. For individuals in transition to postconventional reasoning Kohlberg recommends "personal" role taking, that is the
actual taking on of new roles. For early adolescents typically in transition between pre-conventional and conventional reasoning, role-taking experiences should be "indirect" or "vicarious symbolic" in order to stimulate more complex thought processes.

These theoretical principles were all used in the development of a role-taking curriculum for eighth grade students (Paolitto, 1975). This curriculum utilized a number of role-taking experiences in which moral dilemmas were discussed. Students also designed dilemmas for class discussion as well as for discussion with members of the broader school community. To a considerable extent the intervention was matched to the developmental needs of this population. However, as has been the case with similar curricular efforts described above, no attempts were made to differentiate the treatment on the basis of individual differences between students in the experimental group. Furthermore, no efforts were made to identify factors which appeared to predict developmental gains among the experimental group S's.

Results of this study revealed that the experimental group did not show a significant increase in either moral judgment or perspective-taking (measured by the Selman and Byrne Role-taking Assessment (Selman & Byrne, 1974).

The research cited above involving Selman's interpersonal perspective taking theory reflects a similar approach to the differentiation of (P) and (E) variables to that discussed in relation to moral and ego development theories. In particular, most studies
utilized +1 modeling as well as general principles derived from several developmental theories. Though populations were not differentiated, except informally for purposes of +1 modeling, one study cited (Cooney, 1977) provides support for the use of differentiated outcome measures including stage elaboration in addition to the traditional measure of stage change. The present study will attempt to offer further support to this perspective through incorporating outcome measures which reflect subtle changes in subjects' use of self-knowledge skills. Further research will be needed to determine how stage elaboration might be specifically used as a differentiated outcome (B) matched according to the developmental needs of a particular population.

Applications of Self-knowledge Developmental Theory to Psychological Education

Because Self-knowledge Theory is central to this investigation this section of the review will begin below with a detailed description of the theory and its stages.

The Self-knowledge Theory is a structural developmental theory descriptive of how people conceive of, give meaning to, and report on their personal experiences. The theory proposes that self-knowledge consists of three distinct, inter-related aspects of cognition: (1) direct, immediate, ultimately private experiences of thoughts, feelings, sensations and actions; (2) the developing mental processes people use to translate their experience into descriptive theories;
and (3) descriptive theories individuals hold, usually informally, about their experience, its causes, implications and significance (Alschuler, 1977). Accordingly the theory relies on verbal reports of experience (descriptive theories) to reflect the underlying structures and mental processes necessary to transform the experiences into verbal statements (see diagram below).

![Diagram](SELF-KNOWLEDGE)

Experience → Mental Processes → Descriptive Theories About Experience

From analysis of these verbal reports of individuals' experiences, four basic forms or stages have been identified reflecting how people describe their experiences and knowledge of themselves. These four stages, respectively (1) elemental, (2) situational, (3) internal pattern, and (4) process stages occur in an invariant, hierarchical, non-reversible sequence. At each stage certain types of mental structures are available, while others are not.

At the elemental stage the individual describes his/her experience in terms of discrete, concrete elements of a single event. These elements are not treated as part of a single complex situation but rather are viewed as isolated from one another, often juxtaposed or serially ordered. Descriptions at this stage lack statements of causal relationships and offer little if any editorial commentary.
Typical examples of elemental self-knowledge reports include the following:

"I was wearing my shorts."

"I was in the first grade."

"My mother yelled, 'Do you want some lunch?''"

"I had a dog named Tatum."

"When Dad came home we watched television."

At the situational stage experiences are described in terms of complete situations composed of causally connected elements including not only concrete elements but internal responses as well, that is, emotions, sensations, and complex thoughts.

Typical examples of situational self-knowledge reports include the following:

"I remember being so excited to be the class valedictorian."

"I enjoyed having everyone be so proud of me."

"It was a time when I could really show off and feel o.k. about it."

"Best of all it made my parents proud of me and that made all of the work seem justified even though I still was confused about the future."

At the internal pattern stage the individual can describe experience in terms of his/her internal responses which generalize across situations over time. Individuals see beyond single experiences and are able to hypothesize what their internal responses will be to types of situations.
Typical examples of internal pattern self-knowledge include the following:

"I usually like to feel included when I am with strangers; but I generally don't."

"After going through all of the difficult times I did to get here, I feel as if I am very much in control of my life especially in professional arenas. I almost always feel self-confident and able to take on a challenge."

At the process stage individuals begin to describe conscious actions they take to control, influence, modify or develop their internal states. Though at prior stages internal reactions to situations and across situations are described, at the process stage people describe the processes they use to manage their internal reactions.

Typical examples of process stage self-knowledge include the following:

"When I feel discouraged and alone, I allow myself to feel those feelings and to realize that I'm not going to fall apart, and after a few minutes of acknowledgement of who I am, I go on."

"I found that the only way I could accept myself during the bad times was to remind myself that it's o.k. to not be perfect — 98% is more than adequate."

Though these four stages do not directly correspond to age groupings, some fairly predictable clusters of populations within stages have emerged. In particular most children tend to be elemental and most adolescents are situational. Adults typically fall into situational and pattern stages.

Because Self-knowledge Theory is relatively new, only a few studies have been completed involving the theory's application to psychological education. The first such study (Phillips, Mclain &
Jones, 1977) involved the development of a curriculum for the prevention of drug and alcohol abuse among high school students. This curriculum was matched to the developmental level of this population, assumed (according to the theory) to be generally between situational and pattern stages. Accordingly the curriculum was designed to assist students in cataloguing situations involving the use of drugs or alcohol, in describing feelings associated with these situations, and developing alternatives to their behavior in these situations. Daily objectives, activities and discussion guidelines were based on a developmental sequence which progressed from elemental, through situational to the pattern stages of self knowledge. Both content of activities as well as type or form of activities used were derived from self-knowledge stages, particularly the situational stage. Thus, the sequencing of activities based on developmental stages was accomplished in this study. The curriculum was used by teachers in fifteen schools. Pre and posttest data were collected on self-knowledge level and self-concept to assess the effectiveness of the curriculum. The results suggested positive effects of the curriculum.

This curricular effort provides one of the few examples reported which incorporates a developmental sequencing of activities (moving from less complex toward increasingly developmentally complex tasks) and also in general provides for a matching of the program content to the developmental needs of the population. However, this form of a priori matching (not based on data collected on this population) can not take into account the idiosyncratic developmental requirements of
the particular population involved in this study. The match of (P) to (E) in this study was in this sense similar to the general matching approach involved in the development of the Just Community School (Kohlberg, 1980).

Phillips (1980) conducted a similar study using the same curriculum with 12 to 14 year old students in four Maine junior high schools. This study, in addition to incorporating a general matching of the curriculum to the population (as in the original study cited above), also included the use of experimental and control groups. However, no efforts were made to systematically match or vary interventions based on developmental differences within the subject population. The results of the study revealed that students in experimental groups failed to demonstrate significant gains in self-knowledge level though some groups did exhibit gains in self-esteem and a reduction in drug usage.

Ziff (1979) utilized a matching model design in his investigation of the relationship between a person's self-knowledge stage and his/her ability to use stage-linked self-knowledge processes in responding to questions regarding a human relations training exercise. Ziff hypothesized that participants' abilities to respond to processing questions would be influenced by their self-knowledge stage level. For example he postulated that a person at the pattern stage would be able to successfully answer questions requiring processes associated with the pattern stage (or lower stages) while a person at the elemental stage would be unable to do so. In order to test
this hypothesis Ziff first administered the ERT (see Appendix B) to 111 subjects in order to assess subjects' self-knowledge stage. Then he administered the Mirroring Questionnaire (MQ) (see Chapter III) to this population following the use of the Mirroring activity. The subjects' age range from eight to fifty-nine provided data from all four self-knowledge stages. Four subgroups (elemental, situational, pattern and process) were created based on subjects' scores on the ERT. These subgroups provided for a differentiation of the population (P) for data analysis purposes. Subgroups were compared to one another relative to the percentage of subgroup participants responding successfully to each of the stage-specific questions on the MQ. Though groups were not matched to specific treatments according to stage scores, both population (P) and processing questions (E) were differentiated by self-knowledge criteria to provide for post hoc matching of all subjects. The results of the study confirmed that subjects (matched) responded successfully to questions associated with their stage and lower stage while subjects (unmatched) responded unsuccessfully to questions associated with stages higher than their own. Accordingly the study revealed a significant positive relationship between a person's stage of self-knowledge development and his/her ability to use stage-linked self-knowledge processes in responding to questions.

Ziff's study is of particular interest in this review because it provides one of the few examples found involving the use of differentiated treatments (processing questions) as well as differentiation
of the population, in both instances differentiated by developmental stage criteria. Because of the differentiation of (P) and (E) variables, several matched and unmatched relationships could be tested through the analysis of data.

Due to the scarcity of research involving Self-knowledge Theory and in particular its application to psychological education, the generalizability and significance of the findings of the above studies remain limited contingent upon the further validation of the Experience Recall Test and related self-knowledge instruments. These studies do, however, provide evidence as to the utility of Self-knowledge Theory in the design and planning of psychological educational curricula and goals. Based in part on these earlier research efforts the present study attempts to incorporate both a matching model approach reflecting Ziff's (1979) work and a comprehensive developmentally-based curriculum similar to that used by Phillips (1980). To the extent that the present study can successfully incorporate aspects of these two related studies in its design, it may further support the efforts and findings of both the Ziff and Phillips studies.

Applications of Conceptual Level Developmental Theory—A Contemporaneous Approach

The developmental theories and the application of these theories to psychological education reviewed above have been discussed with particular attention to promoting stage development. In contrast, the work of Hunt (1974, 1977-1978) focuses on contemporaneous matching
designed principally to "produce a specified behavioral effect (B) through coordination of a particular environment (E) with a particular type of person (P)" (Hunt, 1974, p. 74). The contemporaneous approach emphasizes matching the environment to the person's present level while developmental matching utilizes principles and environments most likely to facilitate stage change. These two approaches overlap considerably with one another in their applications to the field of psychological education. There are, however, differences between the developmental and contemporaneous approaches which are generally reflected in goals (B) of programs or related research (described below).

Hunt's work involves the Conceptual Level (CL) Theory based upon the developmental personality theory of Harvey, Hunt and Schroder (1961). This theory is based on a developmental sequence of three stages reflecting increasing conceptual complexity, self-responsibility, and independence. Hunt has summarized these stages as "proceeding from an immature, unsocialized stage (A) to a dependent, conforming stage (B) to an independent, self-reliant stage (C)" (1974, p. 47).

Utilizing a contemporaneous approach, several studies have involved matching the conceptual level of learners (P) to an intervention (E) in order to enhance learning (B). According to Hunt "low CL learners profit from high structure and high CL learners profit from low structure" (1971, p. 44). Thus, such studies hypothesize that low CL subjects matched with high structure and high CL subjects matched with low structure are optimally matched for learning.
Several studies support this view. Studies by Heck (1971), involving the teaching of communication skills, Reid (1975), involving the development of teaching skills and Stein (1976), involving the use of matching in counseling relationships (all cited in Hunt, 1974) showed that students matched according to conceptual level learned better than those unmatched. Finally Brill (1977, cited in Hunt, 1977-78) matched conceptual level of delinquent boys to the structure of treatments used for rehabilitation purposes. As expected, low CL boys matched to high structure and moderate CL boys matched to moderate structure had fewer post discharge adjustment problems than those unmatched.

Though Conceptual Level Theory has not been widely used in applications to psychological education, the few studies cited above utilize matching principles in the differentiation of treatments to enhance learning. In contrast to the more general approaches to matching described in the moral and ego development literature, Conceptual Level Theory appears to lend itself to explicit attempts to identify the optimum degree of structure for learners as a basis for matching person characteristics (P) to the intervention (E).

Because the Conceptual Level Theory is primarily concerned with degree of structure as the basis for differentiating treatments, its applications to educational or training programs is fairly broad. Correspondingly, the theory has been primarily used in relation to the accomplishment of non-developmental objectives such as the teaching of reading or social studies. Thus this theory unlike the others cited in this review has not been used as the basis of curricular
programs or research efforts designed to promote CL stage change or even to facilitate functioning at a given CL stage. Rather, the theory generally is used as a conceptual tool to assist in the facilitation of matching (P) to (E) to improve effectiveness of a given treatment.

Conceptual Level Theory is presented as a part of this review because of the theory's unique attention to contemporaneous goals and because of its explicit use of matching population characteristics (P) to the intervention (E) in order to enhance learning. Conceptual Level Theory thus provides a research model for the present study which involves the facilitation of contemporaneous goals within a matching model framework. The present study may thus be useful as a kind of link between Conceptual Level Theory research and psychological education. Hopefully more psychological education studies will begin to incorporate the principles of Conceptual Level Theory which provide among the most straightforward of examples of matching model applications.

Summary

In this second section of the review of the literature, studies involving applications of developmental theory to the field of psychological education have been discussed. The use of matching and/or differentiation of (B), (P), and (E) components of these studies have been highlighted. The following conclusions regarding these studies are now presented:
1. In general, the curricular programs reviewed, for example those following the Deliberate Psychological Education model, utilize matching principles in only the most general sense. Typically these programs were designed for a specific target population (e.g., adolescents). In the studies reviewed one or more developmental theories were often incorporated in the design of the programs. However the use of developmental theory as a "basis" for these programs was generally limited to developing general curricular objectives such as providing opportunities for social role-taking or incorporating self-reflective questioning. In only one instance cited (Phillips, McClain, Jones, 1977) did a psychological education curriculum reflect the stage criteria of a developmental theory in both the content and sequencing of the curriculum. Even in this case, however, no effort was made to specifically match the curriculum to the idiosyncratic and changing developmental needs of individuals within the population.

2. In general, studies reviewed incorporated the differentiation of only one of the three B-P-E components under investigation. Because most studies reviewed involved populations assumed to be primarily at one stage of development, treatments tended to be more often differentiated than population characteristics (P). Outcomes were rarely differentiated for different populations, though in the majority of studies cited more than one outcome measure was used. Some studies were cited, however, in which differentiation in both (P) and (E) did occur. These included some of the studies utilizing +1 modeling, in particular (Blasi, 1972) and to a lesser extent
studies utilizing heterogeneous groupings (Blatt, 1974; Turiel, 1966) for reasons pointed out by Rest (1974) (see Moral Development). An excellent example of the differentiation of (P) and (E) subsequently used to support a matching model approach to human relations training exercises is provided by Ziff's (1979) study utilizing subjects from all four self-knowledge stages. Finally research based on Conceptual Level Theory uniformly incorporates the differentiation of both (P) and (E) components to provide for the contemporaneous matching of treatment to population to achieve a desired outcome (B).

3. Several developmental theories have been successfully used in the design and evaluation of psychological education interventions, thus further establishing a basis for the application of Self-knowledge Theory to the design and implementation of psychological education curricula. Though psychological education research based upon Self-knowledge Theory is limited, the positive findings cited involving related theories help to provide a rationale for this study. In addition Ziff's (1979) research suggests that self-knowledge level may be an important criterion to employ in a matching model approach to psychological education. The present study may be of use in further substantiating this view.
CHAPTER III

METHODOLOGY

Introduction

This chapter presents the research methodology of the study. Methodological components to be covered in this chapter include statements of operational hypotheses, description of the sample, description and development of the instruments and measures used, design of the study, outline of procedures, discussion of data analysis to be performed, and methodological limitations of the study.

Hypotheses of the Study

The four operational hypotheses of the study (listed below) reflect differentiated expectations regarding the performance of course participants at varying stages of self-knowledge development as assessed by two different instruments (ERT and MERT).

In particular the following four hypotheses were tested:

1. Participants at the elemental or situational stage as measured by the ERT (stage score) will have lower scores on Education of the Self outcome measures (including scores on the posttest, the end-of-semester questionnaire, follow-up questionnaire, and feedback letter), and lower
gain scores on posttest measures than participants at pattern and process stages.

2. Participants at the elemental or situational stage as measured by the ERT (summary score) will have lower scores on Education of the Self outcome measures (including scores on the posttest, the end-of-semester questionnaire, follow-up questionnaire, and feedback letter), and lower gain scores on posttest measures than participants at pattern and process stages.

3. Participants who are unsuccessful in responding to pattern questions on the MERT will have lower scores on Education of the Self outcome measures (including scores on the posttest, the end-of-semester questionnaire, follow-up questionnaire, and feedback letter), and have lower gain scores on posttest measures than participants who successfully answer pattern questions.

4. Participants who are unsuccessful in responding to process questions on the MERT will have lower scores on Education of the Self outcome measures (including scores on the posttest, the end-of-semester questionnaire, follow-up questionnaire and feedback letter), and have lower gain scores on posttest measures than participants who successfully answered process questions on the MERT.
Sample

All 55 students enrolled in either of the two sections of Education of the Self taught through the University of Massachusetts School of Education during the fall, 1981 semester were included as subjects in this study. Of these 55 students, 18 were graduate students and 37 were undergraduates. Because of the greater number of undergraduates enrolled, one section was composed entirely of undergraduates and the other included both graduates and undergraduates. The two sections of the class were utilized in this study in order to maximize the range of self-knowledge levels of participants.

Data was collected on each subject's age, sex, program major, and background in psychological education or related programs. Though participation in this study was voluntary, all students in the course cooperated in this research effort. Subjects who for any reason did not complete the course were excluded from the study.

Design of the Study

This exploratory study utilizes a one group pretest/posttest design. Although this design is not useful in establishing cause and effect relationships, it can be used to postulate relationships between variables and to suggest follow-up research on this topic. Though the one group pretest/posttest design is considered to be methodologically weak (Campbell & Stanley, 1966) the following discussion shows it can be used without sacrifice of external validity
in the investigation of differential effects of a given treatment (B-P-E).

In this study in which the treatment is held constant, the principal question under investigation is whether a particular subject characteristic (self-knowledge level) can be used in matching subjects to treatments in order to maximize outcomes. It is therefore of little concern in this study whether in fact the treatment is entirely responsible for gains in personal learning or if other experiences may also be contributing to students' apparent success in the course, Education of the Self. If students of a particular stage of self-knowledge show a greater level of success in the course than students at other stages, then the finding is valid as an indicator of a relationship between self-knowledge level and Education of the Self. It is of no consequence that the cause of such a relationship may be, for example, that students of this particular stage tend to participate in other personal growth related programs. For if such a tendency contributing to success in the course generally exists among students of this given stage, then the match of students of this stage to the treatment will still result in more successful outcomes for this group than for students at other stages. Because such effects of a matching approach can be revealed by the results of this study regardless of the effect of other intervening variables, controlling for outside influences is relatively unimportant in this study. Thus, the use of a control group is not necessary.
Two groups were used in this design, a graduate* and an undergraduate group totalling 55 subjects. These two groups of students were taught by different instructors in two distinct "sections" of the course designated as graduate and undergraduate respectively. Though these two groups experienced the treatment independently from one another they are generally viewed as one group in this design for the following two reasons: (1) The treatment was essentially the same for both groups due to the training of instructors and use of a detailed trainer's manual which insures against significant departures from the standardized course content. (2) It is not the intent of this study to compare the difference in treatment effects between these two groups. Rather this study is concerned with differential effects of the treatment specifically due to (P) characteristics, primarily self-knowledge stage level of participants. For this reason these two groups are generally treated in the analysis of data as one group, as individuals within both groups are differentiated from one another according to scores on the four independent measures. At the same time, as it is pointed out in the Data Analysis section of this chapter, statistical tests were completed to insure that there were no significant differences in performance between these two groups.

Procedures

1. During the first two sessions of the course, four instruments were administered to all participants of the two Education of the Self

*The graduate group included some undergraduates as well.
sections: the ERT, the MERT, and the two pretest instruments (see Appendix B). This initial battery of testing lasted approximately one hour and fifteen minutes. Testing was conducted by the principal investigator of this study assisted by instructors of the course. All tests were identified by student birthdates to maintain anonymity of students.

2. Subjects attended the 13 weekly sessions of Education of the Self.

3. During the last session of the course, subjects completed the end-of-semester questionnaire evaluating their experiences in the course. In addition the two posttests (pattern and process measures) were also administered at this time.

4. At the end of the course, participant feedback letters were given to course instructors for evaluation purposes. These letters were then rated by the instructors. Each participant's score was then matched with his/her birthdate and subsequently used as another source of data for this study.

5. Approximately three months following the conclusion of the course, the follow-up questionnaire was mailed out to participants to determine lasting effects and generalizability of the course. This questionnaire was mailed with a postage-paid, addressed, return envelope. As with all instruments used in this study, the follow-up questionnaire was identified by student birthdate in order to maintain the anonymity of subjects.
6. Once all data had been collected, random identification numbers were given to each test and questionnaire prior to scoring. Birthdate identification numbers were crossed out on all forms. A master list matching these random numbers with their original birthdate identification numbers was kept by the principal investigator to be used for subsequent data analysis. Two separate sets of random numbers for pre and posttests were also kept. This precaution prevented the use of data from any test or questionnaire to be used to guide or influence the scoring of any other test for any subject.

7. Analysis of data began once all data had been collected, coded, and scored.

**Instruments and Measures**

**Independent Variables**

Two instruments were used to assess participants' pre-treatment self-knowledge level: (a) the Experience Recall Test (ERT), and (b) the Modified Experience Recall Test (MERT). A total of four variables, two based on the ERT and two based on the MERT, were in turn constructed for use in data analysis. These four self-knowledge related variables are referred to as the ERT stage score, ERT summary score, MERT-pattern, and the MERT-process. Each of the four hypotheses of this study use one of these four variables as its independent measure.

In addition to these four self-knowledge measures, data was collected on seven demographic measures as well. A questionnaire completed during the first class session provided the data for three
interrelated motivation measures labeled respectively (a) personal, (b) professional/academic, and (c) lack-of-purpose, as well as such background variables as sex, age, section ("group"), and previous related experience.

These instruments and measures are described and reviewed individually below.

**The Self-Knowledge Experience Recall Test (ERT)**

The Experience Recall Test consists of two parts. First, respondents are asked to recall an unforgettable experience in detail. Then, they are asked to describe this experience as fully as possible and, in addition, to respond to five related self-reflective questions.

A standardized scoring procedure is then used to determine stage level. Only those statements containing an "I-referent" are classified as coding units to be scored. Each coding unit is then identified as belonging to one of the four self-knowledge stages according to the highest stage criteria it satisfies. The percentage of responses at each stage is computed and a summary score for each protocol is obtained by adding together the four percentage figures, weighted in the following manner: elemental percentage multiplied by a factor of 1, situational percentage multiplied by a factor of 2, pattern percentage multiplied by a factor of 4, process percentage multiplied by a factor of 8. As a result of using this procedure, summary scores may range from 100 (all elemental responses) to a maximum of 800 (all process level responses) (Ziff, 1979).
In addition to summary scores, each participant was also assigned an ERT stage score. The procedure for computation of the stage score was originated by Ziff (1979). According to this procedure the stage score is defined as the single highest stage response on each protocol. This procedure for the computation of the ERT stage score is based upon the assumption that the highest stage response on a protocol reflects the individual's ability to respond at this stage (whether or not he/she always uses this ability). Thus the stage score is a measure of self-knowledge competence while the summary score is a measure of performance (reflecting actual behavior on the ERT).

At this time research on the validity and reliability of the instrument is still incomplete. In particular no data exists on the test's internal consistency or temporal stability. However, inter-rater reliability has been demonstrated at above .80 (Alschuler et al., 1975; Ziff, 1979). Also concurrent validity was established through two studies in which the ERT was significantly correlated (.73 and .77) with Loevinger's levels of ego development (Alschuler, et al., 1975). Construct validity of the ERT has been assessed through use of the Guttman Scaling Technique. Coefficients were computed to establish the invariant, hierarchical nature of the stage sequence. The coefficient of scalability was .84 and the coefficient of reproducibility was .97 (Alschuler et al., 1975).
Though the ERT has not been established as fully reliable nor valid according to conventional research criteria, one of the purposes of this study is to provide additional data relative to this instrument's reliability and validity. Accordingly inter-rater reliability was assessed through the coding of twenty-five protocols by two coders. To test validity, both ERT summary and stage scores were used in correlations with other related measures such as the MERT-pattern and MERT-process. Results of these tests are available in Chapter IV.

Modified Experience Recall Test (MERT)

The MERT differs from the ERT in that it is designed to assess subjects' maximum self-knowledge level. Though the ERT reflects subjects' spontaneous use of the processes associated with the self-knowledge stages it does not directly elicit responses of the various stages and thus is not an accurate measure of a subject's capabilities. As Ziff (1979) suggested it may be the individual's "competence" or capacity for pattern or process thinking rather than the spontaneous use of these processes which most reflects the ability to use them when called upon to do so. Because success in Education of the Self is presumed to require only the capacity for, rather than the spontaneous use of, pattern and process stage thinking, the use of an instrument which is designed to measure "competence" or capacity is essential to this study.

For this reason the MERT was developed by the author of this study as a measure of subjects' maximum self-knowledge level. This
instrument is based upon self-knowledge theory and operationally
defined by its stages. In order to determine a subject's capability
for pattern and process stage thinking each question on the MERT
is specifically designed to elicit a response which meets the criteria
of one of the four self-knowledge stages. The form and scoring of
these questions is essentially the same as Ziff (1979) used in his
construction of the Mirroring Questionnaire (MQ).

The MQ upon which the MERT is based was developed by Ziff (1979)
in collaboration with faculty and graduate students at the University
of Massachusetts' School of Education. The Mirroring Questionnaire
combines the use of a structured activity, known as mirroring, with a
paper-and-pencil questionnaire. Following the mirroring activity
participants respond to 8 questions consisting of two stage-appropriate
questions for each of the four self-knowledge stages. These responses
are in turn scored as either successful or unsuccessful relative to
the criteria of the particular stage the question is based on. Be-
cause only two questions are asked at each stage a participant may
score only 0, 1, or 2 on each of four stage measures. Modeling the
MERT after the MQ is parsimonious in this study because the MQ has
already been correlated with the Experience Recall Test (.744 to the
.001 level) the only validated measure of self-knowledge stages. In
addition, inter-coder reliability for the Mirroring Questionnaire was
determined to be greater than 80% (ibid., p. 103).

Though the MQ was shown to be highly correlated with the ERT,
Ziff noted one limitation associated with the instrument's use. In
particular, because the MQ first requires subjects to participate in
the Mirroring activity and then to respond to questions pertaining to their experience of that activity, their answers may be more a function of their reaction to the experience than a pure reflection of their self-knowledge level. Ziff has noted that participants experiencing this activity had a wide range of reactions to it from enthusiastic to disinterested or resistant. Ziff further notes that any activity used to generate self-knowledge data has the potential for such problems.

For this reason the MERT does not include the use of any activity through which to generate self-knowledge data. Instead, like the ERT, the MERT consists of two parts: a set of directions guiding respondents in recalling a particular experience, and a paper-and-pencil questionnaire listing several questions about that experience. One significant difference between the ERT and the MERT in addition to the MERT's eliciting a particular stage level response (see descriptions of ERT and MERT above) is found in the directions for the recall of the experience. Though the ERT does not specify the type of experience to be recalled except that it is "somehow important to you," the MERT specifically asks respondents to recall interpersonal experiences in which they felt uncomfortable or dissatisfied with their own behavior or feelings. The reason for this change is to insure that the subject matter chosen to write about is suitable for process statements. Because the process level requires taking conscious actions to change internal thoughts or feelings, an individual must experience some dissatisfaction with the old or typical thoughts
and feelings in order to be motivated to make the desired change. Thus a situation in which an individual has experienced discomfort with his/her behavior or feelings is much more likely to evoke a process level statement than a comfortable experience in which a person has no need to consider an alternative response (external or internal). Because the MERT is intended to elicit an individual's maximum self-knowledge response level, the test is most effective if it provides opportunities for process level responses.

As in the Mirroring Questionnaire, each question of the MERT is designed to elicit a particular stage level response. However, the questions used for scoring purposes on the MERT reflect only pattern and process stage criteria. In total only six questions are scored, 3 pattern and 3 process. The elemental and situational questions (1-3) are not included in the scoring for two reasons: (1) the population of this study is a relatively homogeneous one assumed to be uniformly capable of pattern level thinking, and (2) the Education of the Self intervention involves primarily pattern and process level skills. Thus it is assumed that mental processes associated specifically with these two stages are essential to success in this course- and accordingly only data involving these two stages are necessary to establish a relationship between participant stage level and success in the course.

In addition to the use of only pattern and process level questions, the MERT format differs from that of the MQ in one other important way: the addition of the hypothetical process question (#8) below.
Do you have any ideas about ways you might try to modify any of your thoughts or feelings in order to change your patterns?

The use of such a question is suggested by question E on the ERT which also allows for a hypothetical response even though a question of this sort was not included in the MQ.

Prior to its use in this study the MERT was tested in a pilot study involving eight subjects. The purpose of the pilot study was to determine the clarity of the instructions, the effectiveness of the questionnaire, and the ease and accuracy in its scoring. Based upon the results of this pilot study, minor modifications were made in the questionnaire and in the directions for the experience recall.

Procedures for scoring responses on the MERT were essentially the same as those used on the MQ. Each response was evaluated according to whether or not the response met the criteria of the particular stage upon which the question was based. Thus a response to a pattern question was rated as successful if the response demonstrated the use of pattern thought processes. The same was true of responses to process questions.

Each successful response was given a score of 1; each unsuccessful response was given a score of 0. Pattern and process summary scores were then calculated separately by adding the total number of points scored on pattern questions (range 0-3) and on process questions (range 0-3) to result in two distinct summary scores. These two scores were subsequently used in data analysis and referred to as MERT-pattern and MERT-process.
Demographic Measures

A total of seven demographic measures were included in this study as independent variables. These measures were used on an exploratory basis in order to suggest directions for future research involving related studies.

Motivation Measures

Three of the measures were designed to assess subjects' reasons or motivation for participating in the course. The three measures were labeled (a) personal, (b) professional/academic, and (c) lack-of-purpose. It was suspected that participants who reported primarily personal or professional reasons for enrolling in the course might perform better on outcome measures than those who were taking the course because it was required or because they needed the credits. A questionnaire was designed to include reasons from each of these three groups. Subjects were asked to rank order from one to three their three most important reasons for enrolling in the course. The list of reasons consisted of the following:

1. personal improvement/self-development/personal growth
2. social (meet some interesting people)
3. needed an elective
4. little work for a good grade ("easy A")
5. intellectual curiosity/enjoyment of subject matter
6. develop skills for use in teaching
7. recommended by someone
8. help in working out a personal problem or conflict
9. learning about myself
10. other

For scoring purposes, reasons #1, #8, and #9 were grouped as personal reasons; #5 and #6 were scored as professional/academic; and #3 and #4 were scored as lack-of-purpose. Reason #10 was scored on an individual basis according to the merits of each write-in. Reasons #2 and #7 were not included in the scoring because these two reasons did not clearly reflect any of the three types of motivation being considered. Questionnaires were scored by giving a score of three to subjects' first choice, a score of 2 to their second choice and a 1 to their third choice. In this way subjects generally received a total of six points (fewer than six if either of the two unscored reasons were selected). Scores on the three motivation measures were computed by totaling the individual scores on items in each category. Thus a subject who chose a personal reason as his second choice and professional/academic reasons for his first and third choices received a score of 2 on the personal measure, a 4 on the professional/academic measure, and a 0 on the lack-of-purpose measure.

This questionnaire was pilot-tested prior to this study to insure that the instructions were clear and that the list of reasons provided an adequate range of alternative choices. Based upon the results of this pilot study, minor changes were made in the list of reasons involving the addition of one reason and a deletion of another which was found to be redundant.
Biographical Measures

Four measures based on biographical data were also included as independent variables. The names and definitions of these measures are listed below.

1. age - the age of the subject in years.
2. sex - the gender of each subject (male or female).
3. group - the section or class (graduate or undergraduate) which was attended by the subject.
4. experience - the amount of previous (1) psychological education-related training, (2) counseling or therapy, or (3) personal growth programs participated in by each subject.

Of these four measures, only the experience measure required developing a special scoring procedure. In order to differentiate between subjects' amount of previous experience two criteria were applied to responses pertaining to this measure: (1) duration of the experience(s) and (2) number of different experiences. In particular, participants who were involved for more than one year in a minimum of three different psychological education-related experiences (including courses as well as individual counseling) were classified as high experience subjects. All other subjects were classified as low experience subjects. Thus the experience measure, like the sex and group measures, had only two values, in this case high and low.
Dependent Measures

A total of five instruments were used in this study to assess outcomes of the course. These five instruments were the pre/posttest (pattern and process components), the end-of-semester questionnaire, the feedback letter, and the follow-up questionnaire. In addition to the five individual outcome measures reflecting summary scores on each of these five instruments, seven composite measures each utilizing two or more of the individual outcomes were also computed for data analysis purposes. These twelve measures are discussed below in relation to the instruments upon which they are based.

Pre/posttests (pattern and process components)

Pre/posttests were developed to determine gains in self-knowledge-related skills as one measure of success in the course. Because the course is primarily designed to assist students in identifying and working with uncomfortable or dissonant patterns it was assumed that successful participation in Education of the Self included: (1) increased knowledge of one's own patterns, and (2) enhanced skills in "treating" dissonant patterns. Accordingly, the pre/posttest consisted of two sections: the first asked respondents to list up to 10 pattern statements (following a definition and illustrations of patterns); the second asked respondents for examples of actual or hypothetical actions taken to modify thoughts or feelings associated with dissonant patterns. Eight minutes were allowed for each section. These two sections of the pre/posttest provided the
basis for four separate measures, a pretest-pattern score, a pretest-process score, a posttest-pattern score, and a posttest-process score. The only difference between pretest and posttest measures was that the pretest was administered during the first class session and the posttest was administered during the last.

As was the case with the MERT, the determination of whether a response met the specifications of pattern or process stages was based upon the same stage-specific criteria used in scoring the ERT. In addition, scoring of pattern and process measures reflected both the quantity of total responses as well as a qualitative dimension of elaboration and complexity of each response.

Pattern statements were given one point if they included a class of situations and an internal response. An additional point was given on each pattern statement which included a second internal response or an external response. A third point was given to those statements which included three distinct internal responses or two internal responses and an external response. A maximum of ten pattern statements were scored for each subject. Thus, summary scores on this measure could range from 0 to 30.

Similarly on the pre/post-process measure, statements were given one point for including both an internal action taken and an internal state (the object of the action). In addition, one-half of a point was given for each additional reference to an internal action or an internal state. A maximum of two points was allowed for each scored response. Because only responses to questions A, B, and D were scored,
the maximum score on this measure was 6 and the minimum score was 0. The instructions and questions pertaining to this measure are presented below.

Think about anything you have tried to do to modify your thoughts or feelings in order to change any of your patterns (either those you listed earlier or others).

A. What thoughts or feelings did you attempt to modify?
B. What did you do to modify them?
C. Were you successful?
D. If you didn't try to change any of your patterns, describe how you might modify your thoughts or feelings if you wished to change some pattern.

Prior to their use in the present study, both sections of the pre/posttest were tested in a pilot study along with the MERT to determine the effectiveness and clarity of the introductory illustrations, the adequacy of the format of the questionnaire, and the ease and accuracy in scoring. Minor modifications were made in this questionnaire according to the results of this pilot study.

Gain Score Measures

In addition to separate pretest and posttest measures for pattern and process components, separate gain scores were also computed. The gain scores were defined by the following formulas:

Gain score pattern = posttest pattern - pretest pattern
Gain score process = posttest process - pretest process

The gain score measure was developed in order to reflect the change in skills presumably resulting from the Education of the Self treatment. It was assumed that the change form pretest to posttest scores would generally be a positive one. It was, further, hypothesized that subjects with higher ERT and MERT scores would show greater
gains than subjects with relatively low ERT and MERT scores (see hypotheses). Because pretest scores were subtracted from posttest scores on these two measures, scores could range from positive to negative numbers. (In cases in which the pretest score was greater than the posttest score, the resulting difference is negative.)

**End-of-semester Questionnaire**

The end-of-semester questionnaire was administered along with the two posttests during the last class session of the semester. This questionnaire was used to assess subjects' self-reported levels of comfort and ease with the course, feelings of satisfaction and interest, accomplishment, and application of course objectives. This questionnaire consisted of fourteen statements on which subjects rated themselves by checking one of three choices (always, never, sometimes; or yes, no, somewhat). Though a more comprehensive questionnaire would have been desirable, the limits of this study and of available class time precluded a more extensive list of items (See Appendix B).

All items on this instrument were scored individually with scores ranging from 0 to 3. A "yes" or "always" response was given a score of 3; a "sometimes" or "somewhat" response was given a score of 1; and a "never" or "no" response received no credit. A summary score on this questionnaire was computed by adding the total points received by each subject. The range of possible scores was from 0 to 42.
Feedback Letter

As part of standard course requirements, at the end of the semester students were required to turn in feedback letters to the instructor. These letters provided detailed accounts of each student's work over the course of the semester. Though no standardized scoring procedure has been developed for these letters, the instructors of the two sections of the course agreed to rate these letters according to the degree of differentiation and complexity of the pattern description used. Letters were rated from 1 to 3 by each subject's instructor according to this single criterion. Because of the confidential nature of these letters they were not read by the principal investigator of this study. Accordingly no data on interrater reliability are available for this outcome measure.

Because completion of these letters was a course requirement, their use in this study put no additional burden on students or staff. In this light, the completion of the feedback letter was perceived by students as part of the design of the course, and as a less contrived experience than the other outcome measures which were all essentially tests or questionnaires. The feedback letter is also a more representative sample of course performance than other measures because it was part of the course rather than a report of experiences in the course or a simulation of course work (as on the remaining measures). For these reasons, it could be argued that the letter rating is perhaps a relatively more important outcome measure than the other outcomes and should be weighted accordingly for the purposes of this study.
Follow-up Questionnaire

In order to assess the relatively lasting impact of the course, a follow-up questionnaire was mailed to participants three months following the conclusion of the course. This questionnaire was based upon the evaluative efforts of Marianne Simon, one of the original Education of the Self instructors (Weinstein, 1975). It asked participants to reflect on (1) their overall reaction to the course, (2) the value of the course in helping them to choose more effective responses to situations, (3) possible applications of the trumpet process to their lives, and (4) personal goals or new directions related to their experiences in Education of the Self. Though space for comments was provided, subjects were given scores on this measure based on their choices of responses following each question (See Appendix B). For the first question, 5 response choices were provided (extremely positive, positive, neutral, somewhat negative, very negative). For the remaining three questions four choices were provided (not at all, little extent, some extent, great extent). Subjects were instructed to check one of these choices in response to each question. For scoring purposes, points ranging from 0 to 3 were given to questions 2, 3, and 4 (which involved four choices: Not at all = 0, Little Extent = 1, Some Extent = 2, Great Extent = 3). Points ranging from 0 to 4 were given to the five possible responses of question 1 (Very Negative = 0, Somewhat Negative = 1, Neutral = 2, Positive = 3, Extremely Positive = 4). A follow-up questionnaire summary score was arrived at by adding the scores on each of these four responses. This total score could range from 0 to 13.
Composite Measures

In order to allow for data analysis (i.e., regressions, correlations and ANOVA's) involving more than a single dependent outcome measure, five composite measures were created to provide for a range of combinations of outcome variables.

Composite 1 = (posttest-pattern)+(posttest-process)+(end-of-semester questionnaire)+(follow-up questionnaire)+(feedback letter)

Composite 2 = (end-of-semester questionnaire)+(follow-up questionnaire)+(feedback letter)

Composite 3 = (posttest-pattern)+(posttest-process)+(end-of-semester questionnaire)+(feedback letter)

Composite 4 = (gain score-pattern)+(gain score-process)+(end-of-semester questionnaire)+(follow-up questionnaire)+(feedback letter)

Composite 5 = (posttest-pattern)+(posttest-process)+(feedback letter)

Each of these measure was specifically designed in order to address potential questions left unanswered by statistical analysis using only individual outcomes. Because of the problem of interpretation associated with posttest scores as well as gain scores on the pre/post-tests, three of the five composite measures were distinguished from one another only in their treatment of the posttest measures. Composite 1 used the posttest scores in addition to the three other principal outcomes. Composite 4 used gain scores rather than posttest
scores in addition to the other three outcomes. Composite 2 deleted all pre/posttest measures while including only the remaining three outcomes. Composite 3 included all individual measures except for the follow-up questionnaire which was the most subjective of the individual measures used. Composite 5 further reduced subjectivity of these measures by deleting both questionnaires from its computation. Thus composites 3 and 5 are the most objective, performance-based measures while composite 2 is the most subjective, self-evaluative measure.

Prior to the computation of composite outcome scores all variables included were standardized to insure equal weighting of each variable used in the composite. The formula used for standardization of variables (Z scores) is presented below:

\[ Z = \frac{X - \bar{X}}{S_X} \]

Data Analysis

The procedures used were designed to generate the following data for each subject:

1. A self-knowledge stage score (elemental, situational, pattern, process) based on the ERT.
2. A self-knowledge summary score (ranging from 100 to 800) based on the ERT.
3. A MERT-pattern score (range from 0-3) reflecting the number of successful responses to the three pattern questions on the MERT.
4. A MERT-process score (range from 0-3) reflecting the number of successful responses to the three process questions on the MERT.

5. A pretest-pattern and posttest-pattern score (range from 0-30) reflecting number of patterns listed with additional points for elaborated patterns.

6. A pretest-process and posttest-process score (range from 0-6) reflecting number of process statements listed with additional points for elaboration.

7. A score on the feedback letter (1-3).

8. A score on the end-of-semester questionnaire (0-42).

9. A score on the follow-up questionnaire (0-13).

10. Gain scores on the two posttests:
    
    Process Gain = (posttest-process) - (pretest-process)
    Pattern Gain = (posttest-pattern) - (pretest-pattern)

11. Scores on each of the three motivation measures: personal, professional/academic, lack-of-purpose (range 0-6).

12. Scores representing sex, age and group of the subject.

13. A bi-modal score representing degree of previous experience in psychological education (high, low).

14. Scores on composite outcome measures 1-5. Subjects received scores only on those composites on which they had data available for all components of the respective composite.

In addition, responses to the ERT, MERT, and pre/posttest (pattern and process) measures were scored by a second coder for twenty-five participants.
The analysis of data included the following statistical procedures:

1. Coder reliability on the ERT, the MERT (pattern and process), and the pre/posttest (pattern and process) was assessed by determining the percentage agreement between two coders relative to raw scores and summary scores on these five measures for 25 participants.

2. A test of Hypothesis 1 was accomplished by (a) use of Kendall Correlations (designed for correlates with few values) between the ERT stage score and all 12 individual and composite outcomes to determine the significance of relationships between ERT stage and outcome measures. (b) use of Chi-square Contingency Coefficient analysis to determine the significance of the relationship between participants' ERT stage scores and their scores on the feedback letter. (c) performing T-tests with each of the five composite measures as dependent variables to determine whether subjects grouped by ERT stage score had significantly different mean scores on outcomes. (d) use of ERT stage score as one of four independent variables (along with the other three self-knowledge measures) in a series of five multiple regressions, each involving one of the five composite measures as the dependent variable. This test provided a comparative view of the relative variance in outcome explained by the ERT stage score.

3. A test of Hypothesis 2 was accomplished by (a) use of Pearson Product Moment Correlation Coefficients between the ERT summary score and all 12 individual and composite outcomes to determine the significance of relationships between the ERT summary score and outcome measures. (b) use of the ERT summary score as one of
four independent variables (along with the other three self-knowledge measures) in a series of five multiple regressions, each involving one of the five composite measures as the dependent variable. This test provided a comparative view of the relative variance in outcome explained by the ERT summary score.

4. A test of Hypothesis 3 was accomplished by (a) use of Kendall and Pearson Correlations between the MERT-pattern and all 12 individual and composite outcomes to determine the significance of relationships between MERT-pattern and outcome measures. (b) use of Chi-square Contingency Coefficient analysis to determine the significance of the relationship between participants' MERT-pattern scores and their scores on the feedback letter. (c) performing an Analysis of Variance with each of the five composite measures as dependent variables to determine whether subjects grouped by MERT-pattern scores had significantly different mean scores on outcomes. (d) use of MERT-pattern scores as one of 4 independent variables (along with the other three self-knowledge measures) in a series of 5 multiple regressions, each involving one of the five composite measures as the dependent variable. This test provided a comparative view of the relative variance in outcome explained by the MERT-pattern score.

5. A test of Hypothesis 4 was accomplished by (a) use of Kendall and Pearson Correlations between the MERT-process score and all 12 individual and composite outcomes to determine the significance of relationships between the MERT-process and outcome measures. (b) use of Chi-square Contingency Coefficient analysis to determine the
significance of the relationship between participants' MERT-process score and their scores on the feedback letter. (c) performing Analysis of Variance with each of the five composite measures as dependent variables to determine whether subjects grouped by the MERT-process score had significantly different mean scores on outcomes. (d) use of the MERT-process score as one of 4 independent variables (along with the other three self-knowledge measures) in a series of 5 multiple regressions, each involving one of the five composite measures as the dependent variable. This test provided a comparative view of the relative variance in outcome explained by the MERT-process score.

6. In order to determine the strength of relationships between self-knowledge based independent measures, correlations (Pearson and Kendall) were computed involving ERT (stage and summary) scores, MERT (pattern and process) scores, and pretest (pattern and process) scores.

7. In order to determine the strength of relationships between individual outcome measures, correlations (Pearson and Kendall) were computed involving the two posttest (pattern and process) measures, the two gain score (pattern and process) measures, the two questionnaire measures and the feedback letter measure.

8. In order to determine whether any of the seven demographic independent measures were related to outcome measures the following tests were completed: (a) a series of two-sample T-tests to determine whether the two groups of students had significantly different scores on course outcomes. (b) correlations between demographic
measures and all 12 outcome measures (using Pearson and Kendall Correlation Coefficients). (c) five multiple regression equations in which all seven demographic measures in addition to the four self-knowledge related measures were used as independent variables with composite outcomes 1-5 used as dependent variables. These regressions were performed in order to provide information on the relative amounts of variance of the dependent measures explained by the demographic variables.

10. In order to determine whether participants' scores improved significantly from pretest to posttest on pattern and process measures, paired T-tests were performed using subjects' mean scores on these two tests.

Methodological Limitations of the Study

External Validity Issues

The principal problems of the one group pretest/posttest design include inability to control for history and maturation of subjects, effects of testing, instrument decay and regression effects. These limitations are primarily due to the lack of a control group (Campbell & Stanley, 1966). Though there is no control group in this study the limitations above are not as relevant here as in other studies lacking a B-P-E framework. That is, because this study is concerned with the differential effects of a treatment on several subgroups defined by self-knowledge levels, each subgroup functions as a control group in relation to all other subgroups. Though there was no group
without treatment, there were groups matched and unmatched to the treatment. Comparing such groups is similar though not equivalent to comparing experimental groups with control groups. Accordingly, the potential effects of the variables above, testing effects for example, are minimized in this study. For if one group shows improvement on the posttest as a result of exposure to the pretest, it is likely that other groups will as well, thus nullifying any statistical effect of the testing effects variable. Of the possible limitations cited above, the two variables least likely to be controlled for are the effects of history, and regression toward the mean on pre and posttest measures. Though other variables (above) may impact on the data, their effect will be negligible.

In addition to these threats to external validity due to the particular design of the study, other limitations such as subject mortality pose unique problems to this investigation. Because completion of certain questionnaires was optional (follow-up questionnaire) and some students were absent for the last two class sessions, the sample size for different outcome measures varied considerably from one measure to the next.

Furthermore, the group of University of Massachusetts students participating in Education of the Self was not randomly selected. The generalizability of the study is therefore limited to similar populations. Though Education of the Self is prototypical of certain psychological education programs and procedures the results of this study are also limited to this specific treatment.
Internal Validity Issues

The Self-knowledge Experience Recall Test has not met all of the reliability criteria essential to test construction. Assessment of temporal stability, internal consistency, intraindividual accuracy, and comparability of forms have not been completed (Ziff, 1979). Results of the test may therefore be influenced by such situational factors as content of the experience chosen to recall, the mood of the person at the time of testing, or the amount of time taken to answer one question relative to another.

In addition to reliability limitations, the ERT has not been adequately examined in all aspects of construct validity. In particular, it is assumed that the self-knowledge stages are "relatively culturally universal" (Tamashiro, 1975). To verify this assumption a positive correlation must be shown to exist between ages and stage scores across several cultural groups. Unfortunately no such studies have been undertaken (ibid).

The MERT which is based on the same principles and scoring procedures as the MQ (correlated with the ERT) is likewise subject to these same limitations. Though neither ERT nor MERT is fully valid nor reliable in terms of standardized criteria they can both be used in this study because their joint use will contribute to further establishing the validity of both instruments.

Though the two posttest measures (pattern and process) were tested for coder reliability, no other outcome measures in this study have been used before and thus no data on reliability or consistency
exist for the three remaining measures (the two questionnaires and the feedback letter).
CHAPTER IV

RESULTS OF INVESTIGATION

Overview

This chapter includes four sections.

1. Description of the sample population and a presentation of their scores on the Experience Recall Test (including summary score and stage score) and on the Modified Experience Recall Test (including pattern scores and process scores).

2. Analysis of inter-coder reliability on all instruments using self-knowledge measures (ERT, MERT-pattern, MERT-process, pre/post pattern questionnaire, pre/post process questionnaire).

3. Analysis of data regarding the four hypotheses of this study.

4. Presentation and analysis of additional research findings.

Description of Sample Population

The population involved in this study consisted of the 55 students at the University of Massachusetts enrolled in the two sections of the course, Education of the Self, during the fall 1981 semester.
Of the 55 students, 10 were male and 45 were female. Ages ranged from 21 to 52. Seventy-six percent of the students were education majors or in graduate education programs, another 10 percent were non-degree students or "undecided," and the remaining 14 percent had majors in such fields as sociology, marketing, home economics, finance, food economy and management. The composition of this population is summarized in Table 1 which provides separate data for each of the two sections taught.

Description of Participants' Responses on the Experience Recall Test (ERT)

Following the scoring of all ERT's, a self-knowledge stage score (SKS) was assigned to each participant. This score reflected the single highest stage-appropriate response given by an individual on the ERT protocol. The distribution of participants' ERT stage scores by group is presented in Table 2.

Table 2 reveals that approximately 3/5 of all subjects achieved a pattern score on this measure while the remaining 2/5 achieved a process score. There were no subjects scored at elemental or situational stages.

Table 3 reflects the distribution of participants' self-knowledge summary scores. Self-knowledge summary scores were computed by adding weighted percentages of participants' raw scores in which elemental responses were given a weight of 1, situational a weight of 2, pattern a weight of 4 and process a weight of 8.
<table>
<thead>
<tr>
<th>Group Number</th>
<th>Description of Group</th>
<th>Age Range</th>
<th>Median Age</th>
<th>Number of Males</th>
<th>Number of Females</th>
<th>Number of Graduates</th>
<th>Number of Undergraduates</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Undergraduate Section</td>
<td>21-24</td>
<td>22</td>
<td>5</td>
<td>20</td>
<td>0</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>Graduate Section</td>
<td>22-52</td>
<td>28</td>
<td>5</td>
<td>25</td>
<td>18</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total Population</td>
<td>21-52</td>
<td>22</td>
<td>10</td>
<td>45</td>
<td>18</td>
<td>37</td>
<td>55</td>
</tr>
</tbody>
</table>
Table 2

Distribution of Participants' Self-knowledge Stage Scores by Group

<table>
<thead>
<tr>
<th>Group</th>
<th>ERT Stage Scores</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Elemental</td>
<td>Situational</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Totals</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3

Distribution of Participants' ERT Summary Scores by Group

<table>
<thead>
<tr>
<th>Group</th>
<th>Range of ERT Summary Scores</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100-150</td>
<td>151-200</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Totals</td>
<td>1</td>
<td>21</td>
</tr>
</tbody>
</table>
Table 4 shows the relationship between the ERT stage score and the summary score for all participants.
These findings show that in general subjects with process stage scores had higher summary scores than subjects with pattern stage scores.

Description of Participants' Responses on the MERT

Table 5 presents a breakdown by group of the number of questions (maximum of 3) answered successfully on the Modified Experience Recall Test (MERT) separately at the pattern and at the process level.

This table reveals that for both groups of subjects the most frequently scored number of successful pattern responses was 2. In contrast, for both groups the most frequently scored number of successful process responses was 0.

MERT summary scores, which combine the number of stage-appropriate pattern responses with process responses, were assigned to each participant. The distribution of these summary scores (which range from 0-6) are presented in Table 6.

Table 6 reveals that for the majority of subjects in both groups the combined number of correct responses to the MERT-pattern and MERT-process ranged from 2 to 4.

Inter-Coder Reliability Data

Inter-coder reliability data were gathered for all instruments utilizing self-knowledge related measures in order to determine the
### Table 4
Relationship Between ERT Stage and Summary Score

<table>
<thead>
<tr>
<th>ERT Stage</th>
<th>Summary Score</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
<td>Median</td>
<td></td>
</tr>
<tr>
<td>Elemental</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Situational</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Pattern</td>
<td>154.0-263.0</td>
<td>202.6</td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td>148.6-327.6</td>
<td>249.9</td>
<td></td>
</tr>
</tbody>
</table>

### Table 5
Distribution of MERT Success Scores by Group

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of stage-linked MERT questions answered successfully</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pattern 0 1 2 3</td>
</tr>
<tr>
<td></td>
<td>Process 0 1 2 3</td>
</tr>
<tr>
<td>1</td>
<td>2 7 10 6</td>
</tr>
<tr>
<td></td>
<td>12 5 6 1</td>
</tr>
<tr>
<td>2</td>
<td>1 5 18 6</td>
</tr>
<tr>
<td></td>
<td>12 11 5 2</td>
</tr>
<tr>
<td>Totals</td>
<td>3 12 28 12</td>
</tr>
<tr>
<td></td>
<td>24 16 11 3</td>
</tr>
</tbody>
</table>
Table 6

Distribution of MERT Summary Success Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Summary Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0  1  2  3  4  5  6</td>
</tr>
<tr>
<td>1</td>
<td>0  5  6  7  5  0  1</td>
</tr>
<tr>
<td>2</td>
<td>0  4  8  7  9  2  0</td>
</tr>
<tr>
<td>Totals</td>
<td>0  9 14 14 14 2  1</td>
</tr>
</tbody>
</table>
extent to which participants' scores on these instruments reflected a coder's idiosyncratic application of coding principles. It has been suggested in related studies (Ziff, 1979) that a reliability quotient of .80 (80% agreement) between two coders is necessary to insure reliability of coding and of conclusions.

Five instruments were tested for coding reliability: The ERT, the MERT-pattern, MERT-process, the pre/post pattern questionnaire and the pre/post process questionnaire. For each instrument, twenty-five randomly selected protocols or questionnaires were selected for coding by two coders. Both coders had been trained in coding the ERT and relied upon a similar set of guidelines for scoring the other instruments (see Chapter III).

Reliability scores for these five instruments were expressed in two ways, respectively through a raw-score reliability figure, and a summary score reliability figure.

Raw scores for the ERT reflected the individual stage score assigned to each coding unit of a protocol by each of the two coders. Accordingly, the percentage of agreement between coders is defined by this formula:

\[
\text{Percentage of agreement} = \frac{\text{Total number of units with coding agreement}}{\text{Total number of coding units}} \times 100
\]

Raw scores for the MERT-pattern and MERT-process are identical to profile scores, which reflect success or failure in making stage-appropriate responses to three pattern questions and three process questions respectively. Accordingly, raw score percentage of agreement on the MERT tests is defined by the formula:
Percentage of agreement = \[
\frac{\text{Total number of responses with coding agreement}}{3 \times (\text{the number of MERT protocols})} \times 100
\]

Raw scores for the pre/post pattern questionnaire reflect individual scores given to each pattern statement listed (maximum of ten statements per questionnaire). Pattern statements received scores of 0-3 depending upon the elaboration of the pattern (see Chapter III). Raw score percentage of agreement on this section of the pre/post questionnaire is defined by the formula:

\[
\text{Percentage of agreement} = \frac{\text{Total number of pattern statements with coding agreement}}{\text{Total number of pattern statements}} \times 100
\]

Similarly, raw scores for the pre/post process questionnaire reflect the extent to which responses to process level questions are stage appropriate. Each of three questions on this questionnaire were given a score of 0-2. Because only three questions per questionnaire were used to obtain scores on this measure, the formula for percentage of agreement is defined as:

\[
\text{Percentage of agreement} = \frac{\text{Total number of responses with coding agreement}}{3 \times (\text{the number of pre/post tests coded})} \times 100
\]

Summary scores for all five instruments were arrived at by adding all raw scores on each protocol or questionnaire. These scores, rather than the raw scores, were subsequently used for data analysis purposes.
Percentage of agreement for summary scores on all five instruments was computed as a quotient of the pairs of summary scores (A and B) assessed by the two coders. In this formula, summary score B is always the larger of the two scores arrived at by the two coders.

\[
\text{Percentage of agreement} = \frac{\text{Summary score } A}{\text{Summary score } B} \times 100
\]

The results of the inter-coder reliability tests are summarized in Table 7.

The discrepancy in MERT process scores from a raw score figure of 87% to a summary score percentage agreement of 67% may reflect some limitations of the formula for reliability in relation to this measure. Specifically, high percentage agreement figures as defined by the above formula become more difficult to achieve when there is a high frequency of scores of 0 or 1 (as on the MERT process, where 74% of subjects scored 0 or 1). This is because a summary score of 0 or 1 shows considerably less agreement with scores which are discrepant by one point than do summary scores of 2, 3, or 4.* That is, the potential for high percentage disagreement increases as scores approach 0. For this reason a more accurate measure of the inter-coder reliability on MERT process summary scores may be the average disagreement between scores of two coders. This figure is computed by using the following formula:

\[
\text{Average disagreement} = \frac{\text{Difference between pairs of summary scores}}{\text{Total number of tests}} (25)
\]

*This explains why the summary scores on other measures have a higher percentage agreement than their corresponding raw scores.
Table 7
Inter-Coder Reliability -- Percentage Agreement

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Raw Scores</th>
<th>Summary Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience Recall Test (ERT)</td>
<td>80%</td>
<td>88%</td>
</tr>
<tr>
<td>Modified Experience Recall Test (MERT)</td>
<td>81%</td>
<td>85%</td>
</tr>
<tr>
<td>Pattern Success Scores</td>
<td>87%</td>
<td>67%</td>
</tr>
<tr>
<td>Pre/Post Pattern Questionnaire</td>
<td>87%</td>
<td>94%</td>
</tr>
<tr>
<td>Pre/Post Process Questionnaire</td>
<td>83%</td>
<td>85%</td>
</tr>
</tbody>
</table>
Using this formula the average disagreement on the MERT-process was .32 (N=25), approximately the same as on the MERT-pattern. This finding indicates that the two coders disagreed on average by 1/3 point (on a scale of 0-3) on each test, or that for every three tests, coders disagreed by one point. Though these figures are not readily converted to reliability scores, they do suggest that the MERT-process summary scores may fall within the range of acceptable reliability when tested according to criteria more suitable to the scoring of this measure.

With the possible exception of the MERT-process summary score figure, all raw score and summary score percentage agreement figures achieved the minimum accepted standard of reliability — 80%. Accordingly, it may be concluded that coding reliability is acceptable for these instruments. Though raw scores are not used directly for purposes of data analysis, the raw score percentages are important to the extent that they provide the basis for computation of summary scores which are used in the analysis of data. The relatively high rate of agreement on the MERT-process success scores (raw score component) of 87% confirms that this measure, which served as the basis for the MERT-process summary score, was essentially reliable.

Tests of Primary Hypotheses

The primary focus of this study was to determine whether a positive relationship exists between a person's stage of self-knowledge development and his/her performance and satisfaction as a participant in the course Education of the Self.
The four operational hypotheses of the study reflect differentiated expectations regarding the performance of course participants at varying stages of self-knowledge development assessed by two different instruments (ERT and MERT).

In particular the following four hypotheses were tested:

1. Participants at the elemental or situational stage as measured by the ERT (stage score) will have lower scores on Education of the Self outcome measures (including scores on the posttest, the end-of-semester questionnaire, follow-up questionnaire, and feedback letter), and lower gain scores on posttest measures than participants at pattern and process stages.

2. Participants at the elemental or situational stage as measured by the ERT (summary score) will have lower scores on Education of the Self outcome measures (including scores on the posttest, the end-of-semester questionnaire, follow-up questionnaire, and feedback letter), and lower gain scores on posttest measures than participants at pattern and process stages.

3. Participants who are unsuccessful in responding to pattern questions on the MERT will have lower scores on Education of the Self outcome measures (including scores on the posttest, the end-of-semester questionnaire, follow-up questionnaire and feedback letter), and have lower gain scores on posttest measures than participants who successfully answer pattern questions.
4. Participants who are unsuccessful in responding to process questions on the MERT will have lower scores on Education of the Self outcome measures (including scores on the posttest, the end-of-semester questionnaire, follow-up questionnaire and feedback letter), and have lower gain scores on posttest measures than participants who successfully answer process questions on the MERT.

Prior to testing these four hypotheses, a series of two-sample T-tests were completed through which it was determined that there were no significant differences between the mean scores of the two groups of subjects (undergraduate and graduate classes) on any outcome measures. Thus data from both groups could be treated collectively throughout the testing of the four hypotheses.

The results of the tests of these hypotheses are summarized below.

**Hypothesis 1**

Because there were no subjects in this study with elemental or situational stage scores, the first hypothesis could not be tested in its present form. An adjusted hypothesis based on the existing data could be tested however. In particular, the first hypothesis suggests that participants at higher self-knowledge stages will have higher outcome scores than participants at lower self-knowledge stages. A slight modification of the original hypothesis
dictates that participants with process stage scores on the ERT will have higher outcome scores and gain scores than participants at the pattern stage.

This hypothesis was tested by means of statistical procedures appropriate for discontinuous independent variables, in particular Chi-square analysis and T-tests.

T-tests were computed to determine whether groups of pattern and process level subjects had significantly different means on the five composite outcome measures. Results of these tests revealed no significant findings at the .05 level of significance.

However, results of Pearson and Kendall correlations yielded more favorable findings with the ERT stage score. All correlations between the ERT stage score and outcome measures significant to the .05 level (using either Kendall or Pearson correlation coefficients) are reported in Table 8.

Though one composite measure and two individual measures were significantly correlated with the ERT stage score, the composite score correlation appears to simply reflect the highly significant relationship to the feedback letter, and the less significant relationship to the posttest pattern score.

Further determination of the relationship between the feedback letter and the ERT stage score was made possible through Chi-square analysis. The results of this test are summarized in Table 9.
<table>
<thead>
<tr>
<th>Variable Paired With ERT Stage</th>
<th>N</th>
<th>Kendall Correlations</th>
<th>Pearson Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite 5</td>
<td>38</td>
<td>r = .27**</td>
<td>r = .27*</td>
</tr>
<tr>
<td>Letter</td>
<td>40</td>
<td>r = .40***</td>
<td>r = .39**</td>
</tr>
<tr>
<td>Posttest (pattern)</td>
<td>45</td>
<td>r = .19*</td>
<td>r = .15</td>
</tr>
</tbody>
</table>

* p ≤ .05  
** p ≤ .01  
*** p ≤ .001

Composite 1: posttest (pattern and process), end-of-semester questionnaire, follow-up questionnaire, feedback letter

Composite 2: end-of-semester questionnaire, follow-up questionnaire, feedback letter

Composite 3: posttest (pattern and process), end-of-semester questionnaire, feedback letter

Composite 4: gain scores (pattern and process), end-of-semester questionnaire, follow-up questionnaire, feedback letter

Composite 5: posttest (pattern and process), feedback letter
This table reveals that process stage subjects received significantly higher ratings on the feedback letter than did pattern stage subjects. The difference in scores between these two groups is most apparent in the comparison between the percentage figures of column 3. This column displays a comparison of the percentage of subjects from pattern and process groups who received the highest rating on the feedback letter. Three-quarters of the process level subjects, compared to approximately 1/5 (20.8%) of the pattern level subjects received the highest rating. Though the pattern stage score does not preclude a participant's receiving a rating of "3", this likelihood is significantly decreased for pattern subjects relative to process subjects.

The statistics reported below the table confirm that a highly significant relationship exists between stage score and ratings on the feedback letter and that the relationship expressed in the table is a "real" one, probably not due to chance.

In addition to tests utilizing individual outcome measures, a series of multiple regressions were performed involving all 5 composite outcome measures. Self knowledge stage was one of the 4 independent variables used in these regressions. The findings of these tests revealed only one significant relationship involving the ERT stage score. This was the relationship between the ERT stage score and the dependent measure, the composite 5 score. Though the relationship was a significant one (p=.04) the variance
<table>
<thead>
<tr>
<th>ERT Stage Score</th>
<th>Feedback Letter Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum Pattern Articulation</td>
</tr>
<tr>
<td>Pattern</td>
<td>7 (29.2%)</td>
</tr>
<tr>
<td>Process</td>
<td>3 (18.7%)</td>
</tr>
<tr>
<td>Totals</td>
<td>10 (25%)</td>
</tr>
</tbody>
</table>

Raw Chi-square = 12.7
Degree of Freedom = 2
Level of Significance = .0017
attributable to the ERT stage score was a very modest 2.2%. This relatively small amount of variance explained by the stage score may be misleading however. Because the stage score was the second variable added to the regression equation, the majority of the explained variance had already been attributed to the first variable, the MERT pattern. See Table 13 for more details.

In summary, the ERT stage score was not significantly related to most outcomes and only minimally related to the posttest pattern score and 1 of the composite measures. However, the ERT stage score was strongly correlated with the feedback letter as assessed by Chi-square analysis as well as by Kendall correlation computation. Because of the relative importance of the feedback letter as a measure of performance and learning in the course, and also given the strength of the relationship between this measure and ERT stage, this finding must be given considerable weight relative to the present hypothesis. Accordingly, the adjusted hypothesis predicting a positive relationship between the ERT stage score and the outcome measures of the course is at least partially confirmed.

Hypothesis 2

The second hypothesis can only be tested following conversion of ERT summary scores to stage scores. Though at the present time no definitive criteria exist as a basis for conversion of these scores, a related study (Ziff, 1979) reports a range of summary
scores related to each stage as follows:

Elemental      - 100
Situational    - 108-160
Pattern        - 150-235
Process        - 215-340

Data from the present study corroborate these general findings (see Table 4). Accordingly, summary scores under 150 (the lower end of the pattern range) may be classified as situational (or elemental if below 110).

Because there were no summary scores which fell in this range, this hypothesis could not be tested using the available data.

Though differentiated outcomes for the participants at the four self-knowledge stages cannot be tested for given the limitations of this population sample, the existing range of summary scores does allow for the testing of a related hypothesis (see discussion of Hypothesis 1). In particular a slight modification of Hypothesis 2 is constructed by deleting the classification of sample groups by stage level. This adjusted hypothesis simply predicts that participants with high ERT summary scores (relative to other participants' scores) will have higher outcomes scores and gain scores than participants with lower ERT summary scores.

This hypothesis was tested through Pearson Product Moment Correlations of ERT summary scores and all individual and combined outcome measures.
The results of these tests revealed no significant relationships with outcome measures. In addition to correlation analysis, the ERT summary score was included as an independent variable in the 5 linear regressions using all composite outcome measures as dependent variables. The results revealed no significant relationships involving the ERT summary score. Because of the poor results of these tests, and the difficulty of using the ERT summary score as a grouping variable, no additional tests were completed utilizing the ERT summary score as an independent variable.

With no additional data supporting relationships between the ERT summary score and other outcome measures, it must be concluded that the ERT summary score is not related to Education of Self outcome measures and accordingly the original and adjusted hypotheses must be rejected.

**Hypothesis 3**

Scores on the MERT-pattern ranged from 1 to 3 (discontinuous values) making this measure suitable for statistical tests employing MERT-pattern as a grouping variable. Accordingly, analysis of variance was used to determine whether means of composite outcome scores varied significantly between groups of participants (grouped by their respective numbers of successful answers to pattern questions on the MERT: 1, 2, or 3).

Among the five ANOVA tests completed, one revealed significant results and two approached significance. The results of these three tests are summarized in Table 10.
Table 10

MERT-Pattern ANOVA's

<table>
<thead>
<tr>
<th></th>
<th>MERT-Pattern Scores</th>
<th></th>
<th></th>
<th></th>
<th>M.S.S.</th>
<th>DF</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 Mean N 2 Mean N 3 Mean N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite 1</td>
<td>3.01 6 1.27 9 1.65 4</td>
<td></td>
<td></td>
<td></td>
<td>79.86</td>
<td>2</td>
<td>4.59</td>
<td>.027</td>
</tr>
<tr>
<td>(N=19)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite 2</td>
<td>-1.61 6 .66 9 .94 4</td>
<td></td>
<td></td>
<td></td>
<td>23.09</td>
<td>2</td>
<td>3.07</td>
<td>.074</td>
</tr>
<tr>
<td>(N=19)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite 5</td>
<td>-1.22 10 .07 18 1.22 9</td>
<td></td>
<td></td>
<td></td>
<td>28.46</td>
<td>2</td>
<td>2.98</td>
<td>.064</td>
</tr>
<tr>
<td>(N=37)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
These results reflect significantly different mean scores for participants grouped by their scores on the MERT-pattern. The greatest variance between means is reported in the ANOVA involving the composite 1 score. Because this composite score (as well as composite 5) includes posttest scores rather than gain scores on the pre/post pattern and process measures, the results of these two tests may be subject to criticism. Furthermore, results of analysis of covariance between these same variables controlling for pretest scores (pattern and process), yields no significant variation between the means of the three groups. Accordingly, no claims of causal relationships can be made based on these results. Further studies will be necessary to determine whether significant variations between means are due to the MERT-pattern variable or to the effects of the pretest on the posttest (pattern and process).

Further evidence of the relationship between the MERT-pattern score and several of the outcome measures is reflected in the list of Kendall and Pearson correlations in Table 11. Only correlations significant to the .05 level (using either Kendall or Pearson) are reported.

The correlations cited in this table, in general, support the findings of the analyses of variance. As was the case with the self-knowledge stage score, the MERT-pattern has a relatively strong relationship to the feedback letter as is evidenced by the Pearson correlation coefficient $r=.42$ ($p=.001$). Though the MERT-pattern appears to have no relationship to three of the remaining variables in composite score 1 and only a slightly positive relationship to
Table 11
MERT-Pattern Correlation

<table>
<thead>
<tr>
<th>Variable Paired with MERT-Pattern</th>
<th>N</th>
<th>Kendall Correlation</th>
<th>Pearson Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite 1</td>
<td>19</td>
<td>.40**</td>
<td>.53**</td>
</tr>
<tr>
<td>Composite 2</td>
<td>19</td>
<td>.34*</td>
<td>.47*</td>
</tr>
<tr>
<td>Composite 5</td>
<td>37</td>
<td>.30**</td>
<td>.38**</td>
</tr>
<tr>
<td>Pattern Gain Score</td>
<td>42</td>
<td>.18*</td>
<td>.13</td>
</tr>
<tr>
<td>Feedback Letter</td>
<td>39</td>
<td>.39***</td>
<td>.42**</td>
</tr>
<tr>
<td>Composite 4</td>
<td>19</td>
<td>.37*</td>
<td>.43*</td>
</tr>
</tbody>
</table>

* p ≤ .05  
** p ≤ .01  
*** p ≤ .001
the posttest pattern score \((r=.22)\) (see Table 14), the correlation with the composite score is a relatively strong one \((.53)\). This apparent discrepancy may be the result of a non-representative sample of scores \((N=19)\) used for the correlation with the composite measure.

It should be noted that the MERT-pattern correlation with composite score 2 is only slightly less than that with composite score 1. The deletion of the two posttest scores from the composite outcome apparently did not seriously affect the relationship. Furthermore, when gain scores were used in place of simple posttest scores (composite 4) there was little change in the relationship relative to the composite score with no pre/post measure included. The finding of this apparent positive relationship between MERT-pattern and the pattern gain score is further evidenced by the positive though weak correlation of .13 (Pearson) between these two individual measures.

Further exploration of the relationship between MERT-pattern and the feedback letter was accomplished through Chi-square analysis presented in Table 12.

In this table participants are grouped according to the number of pattern questions answered successfully on the MERT \((1, 2, 3)\). The table reveals that participants who successfully responded to all 3 pattern questions on the MERT received significantly higher ratings on the letter than participants who responded successfully to only one or two questions. In general, the table shows that participants had higher percentages of higher ratings as their number of successful
Table 12
Chi-Square Analysis: MERT-pattern by Feedback Letter

<table>
<thead>
<tr>
<th>Mert-pattern Score</th>
<th>Feedback Letter Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum Pattern Articulation</td>
</tr>
<tr>
<td>1</td>
<td>4 (40%)</td>
</tr>
<tr>
<td>2</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>3</td>
<td>1 (11.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>10 (25.6%)</td>
</tr>
</tbody>
</table>

Raw Chi-square = 12.2
Degrees of Freedom = 4
Level of Significance = .016
responses to the MERT-pattern increased. These figures show that of the participants who answered one question, only 1/5 (20%) were given a rating of 3. On the other hand, of participants who answered all 3 questions successfully, almost 9/10 (88.9%) received the rating of 3. Though the score of only one successful response on the MERT-pattern does not preclude the possibility of a participant receiving a rating of "3" on the letter, this likelihood is significantly decreased for participants who answered only one pattern question relative to participants who answered all three.

The statistics reported below the table confirm that a highly significant relationship exists between MERT-pattern scores and ratings on the letter and that the relationship expressed in the table is a "real" one, probably not due to chance.

Additional findings supporting the hypothesis that the MERT-pattern score was related to outcome scores are provided by the data from the stepwise linear regression equations discussed above in relation to hypotheses 1 and 2.

Summary tables of the four regressions which revealed significant results are presented in Table 13.

The results presented in Table 13 are consistent with the findings presented earlier, particularly those of the ANOVA's (Table 10). The MERT-pattern score again appears most strongly related to the composite 1 outcome measure, the most inclusive of the composite outcomes used. MERT-pattern explains over 28% of the variance in this measure, while the stepwise addition of the other three independent measures explains only an additional 3% of the variance. Similarly,
### Table 13

Summary Tables of Multiple Regressions Using Four Independent Variables

**Dependent Variable: Composite 1 (N=19)**

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable Entered</th>
<th>F</th>
<th>Significance</th>
<th>Multiple R</th>
<th>$R^2$</th>
<th>$R^2\Delta$</th>
<th>R</th>
<th>Total F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MERT-Pattern</td>
<td>6.737</td>
<td>.019</td>
<td>.533</td>
<td>.284</td>
<td>.284</td>
<td>.533</td>
<td>6.737</td>
<td>.019</td>
</tr>
<tr>
<td>2</td>
<td>ERT Summary</td>
<td>.452</td>
<td>.511</td>
<td>.551</td>
<td>.303</td>
<td>.020</td>
<td>.044</td>
<td>3.486</td>
<td>.055</td>
</tr>
<tr>
<td>3</td>
<td>MERT-Process</td>
<td>.193</td>
<td>.666</td>
<td>.559</td>
<td>.312</td>
<td>.009</td>
<td>.167</td>
<td>2.271</td>
<td>.122</td>
</tr>
<tr>
<td>4</td>
<td>ERT Stage</td>
<td>.015</td>
<td>.903</td>
<td>.558</td>
<td>.313</td>
<td>.001</td>
<td>.193</td>
<td>1.596</td>
<td>.230</td>
</tr>
</tbody>
</table>

**Dependent Variable: Composite 2 (N=19)**

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable Entered</th>
<th>F</th>
<th>Significance</th>
<th>Multiple R</th>
<th>$R^2$</th>
<th>$R^2\Delta$</th>
<th>R</th>
<th>Total F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MERT-Pattern</td>
<td>4.855</td>
<td>.042</td>
<td>.471</td>
<td>.222</td>
<td>.222</td>
<td>.471</td>
<td>4.855</td>
<td>.042</td>
</tr>
<tr>
<td>2</td>
<td>ERT Summary</td>
<td>1.969</td>
<td>.180</td>
<td>.554</td>
<td>.307</td>
<td>.085</td>
<td>.204</td>
<td>3.550</td>
<td>.053</td>
</tr>
<tr>
<td>3</td>
<td>ERT Stage</td>
<td>.103</td>
<td>.753</td>
<td>.559</td>
<td>.312</td>
<td>.005</td>
<td>.229</td>
<td>2.268</td>
<td>.122</td>
</tr>
</tbody>
</table>
Table 13 (continued)

Dependent Variable: Composite 4 (N=19)

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable Entered</th>
<th>F</th>
<th>Significance</th>
<th>Multiple R</th>
<th>R²</th>
<th>R²Δ</th>
<th>R</th>
<th>Total F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MERT-Process</td>
<td>3.867</td>
<td>.066</td>
<td>.430</td>
<td>.185</td>
<td>.185</td>
<td>.430</td>
<td>3.867</td>
<td>.066</td>
</tr>
<tr>
<td>2</td>
<td>ERT Summary</td>
<td>.400</td>
<td>.536</td>
<td>.453</td>
<td>.205</td>
<td>.020</td>
<td>.063</td>
<td>2.065</td>
<td>.159</td>
</tr>
<tr>
<td>3</td>
<td>MERT-Process</td>
<td>.083</td>
<td>.777</td>
<td>.458</td>
<td>.209</td>
<td>.004</td>
<td>.135</td>
<td>1.325</td>
<td>.303</td>
</tr>
<tr>
<td>4</td>
<td>ERT Stage</td>
<td>.043</td>
<td>.839</td>
<td>.460</td>
<td>.212</td>
<td>.002</td>
<td>.228</td>
<td>.941</td>
<td>.469</td>
</tr>
</tbody>
</table>

Dependent Variable: Composite 5 (N=37)

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable Entered</th>
<th>F</th>
<th>Significance</th>
<th>Multiple R</th>
<th>R²</th>
<th>R²Δ</th>
<th>R</th>
<th>Total F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MERT-Process</td>
<td>6.119</td>
<td>.018</td>
<td>.386</td>
<td>.149</td>
<td>.149</td>
<td>.386</td>
<td>6.119</td>
<td>.018</td>
</tr>
<tr>
<td>2</td>
<td>ERT Stage</td>
<td>.915</td>
<td>.345</td>
<td>.414</td>
<td>.171</td>
<td>.022</td>
<td>.296</td>
<td>3.510</td>
<td>.041</td>
</tr>
<tr>
<td>3</td>
<td>ERT Summary</td>
<td>.929</td>
<td>.342</td>
<td>.440</td>
<td>.194</td>
<td>.022</td>
<td>.010</td>
<td>2.644</td>
<td>.065</td>
</tr>
</tbody>
</table>
in the cases of the other three regression equations the MERT-pattern score explains from 15% to 22% of the variance in the outcome, with $R$ values ranging from .38 to .52. These regression equations reflect the comparative strength of the four independent measures in determining the variance in the four composite outcome measures. In all four cases the MERT-pattern measure explained significantly more variance than the remaining independent variables.

Table 14 which presents all correlations between the four primary independent measures and the twelve individual and composite outcomes of the course further attests to the relative strength of the MERT-pattern as a correlate to outcome measures.

In summary, the data presented in Tables 10-14 reflect positive relationships between the MERT-pattern score and four of the five composite measures as well as three of seven individual outcome measures. These results are primarily due to strong relationships between the MERT-pattern and three individual outcome measures: the feedback letter, the pattern components of the posttest measure, and posttest gain score. Though positive relationships were not found with all outcomes, the relationships identified were relatively significant in several cases, particularly those relationships involving the feedback letter. Accordingly, these findings support the partial confirmation of the third hypothesis.
### Table 14

Self-knowledge Independent Measures: Correlations with Outcomes

<table>
<thead>
<tr>
<th></th>
<th>ERT Stage K</th>
<th>ERT Summary K</th>
<th>MERT Pattern K</th>
<th>MERT Process K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posttest Pattern (N=45)</td>
<td>.19*</td>
<td>.15</td>
<td>-.01</td>
<td>-.06</td>
</tr>
<tr>
<td></td>
<td>.17</td>
<td>.22</td>
<td>.07</td>
<td>.03</td>
</tr>
<tr>
<td>Posttest Process (N=45)</td>
<td>.11</td>
<td>.12</td>
<td>.01</td>
<td>-.03</td>
</tr>
<tr>
<td></td>
<td>.11</td>
<td>.15</td>
<td>-.08</td>
<td>-.05</td>
</tr>
<tr>
<td>Pattern Gain (N=43)</td>
<td>-.06</td>
<td>-.05</td>
<td>-.16</td>
<td>-.24</td>
</tr>
<tr>
<td></td>
<td>.18*</td>
<td>.13</td>
<td>-.06</td>
<td>-.12</td>
</tr>
<tr>
<td>Process Gain (N=43)</td>
<td>.03</td>
<td>.06</td>
<td>.20*</td>
<td>-.25</td>
</tr>
<tr>
<td></td>
<td>.04</td>
<td>.005</td>
<td>-.05</td>
<td>-.05</td>
</tr>
<tr>
<td>Letter (N=40)</td>
<td>.40***</td>
<td>.39**</td>
<td>.02</td>
<td>.06</td>
</tr>
<tr>
<td></td>
<td>.39***</td>
<td>.42**</td>
<td>.22*</td>
<td>.26</td>
</tr>
<tr>
<td>End of Semester</td>
<td>-.12</td>
<td>-.11</td>
<td>-.16</td>
<td>-.19</td>
</tr>
<tr>
<td>Questionnaire (N=44)</td>
<td>-.09</td>
<td>-.12</td>
<td>-.007</td>
<td>-.07</td>
</tr>
<tr>
<td>Follow-up Questionnaire</td>
<td>-.05</td>
<td>.005</td>
<td>.01</td>
<td>.09</td>
</tr>
<tr>
<td>(N=23)</td>
<td>.06</td>
<td>.16</td>
<td>.13</td>
<td>.04</td>
</tr>
<tr>
<td>Composite 1 (N=19)</td>
<td>.24</td>
<td>.19</td>
<td>.11</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td>.40**</td>
<td>.53**</td>
<td>.23</td>
<td>.17</td>
</tr>
<tr>
<td>Composite 2 (N=19)</td>
<td>.21</td>
<td>.23</td>
<td>.12</td>
<td>.20</td>
</tr>
<tr>
<td></td>
<td>.34*</td>
<td>.47*</td>
<td>.26</td>
<td>.14</td>
</tr>
<tr>
<td>Composite 3 (N=37)</td>
<td>.14</td>
<td>.15</td>
<td>-.12</td>
<td>-.12</td>
</tr>
<tr>
<td></td>
<td>.12</td>
<td>.25</td>
<td>.02</td>
<td>.01</td>
</tr>
<tr>
<td>Composite 4 (N=19)</td>
<td>.24</td>
<td>.23</td>
<td>.04</td>
<td>.06</td>
</tr>
<tr>
<td></td>
<td>.37</td>
<td>.43*</td>
<td>.19</td>
<td>.13</td>
</tr>
<tr>
<td>Composite 5 (N=38)</td>
<td>.27**</td>
<td>.27*</td>
<td>.02</td>
<td>-.02</td>
</tr>
<tr>
<td></td>
<td>.30**</td>
<td>.38**</td>
<td>.06</td>
<td>.08</td>
</tr>
</tbody>
</table>

* *p≤.05
** **p≤.01
*** ***p≤.001

K=Kendall correlations

P=Pearson correlations
Hypothesis 4

Scores on the MERT-process ranged from 0 to 3 (discontinuous values) making this measure suitable for the same statistical tests as employed with the MERT-pattern: Kendall correlations, ANOVA's, Chi-square analysis (with the feedback letter) and multiple regressions using composite outcome measures.

Computation of correlations with all 12 individual and composite outcome measures revealed only one moderately significant relationship with an outcome (the feedback letter). This correlation is presented in Table 15.

The absence of significant relationships with composite measures was underscored in five analyses of variance and five multiple regression equations in which no significant relationships were found involving the MERT-process with the composite outcome measures.

In addition, though a moderately positive relationship between the MERT-process and the feedback letter was identified through the Kendall computations, subsequent Chi-square analysis did not reveal any significant relationship.

In summary, only one of the twenty-three statistical tests involving the MERT-process revealed a statistically significant positive relationship with an individual or composite outcome measure. These results strongly suggest that the MERT-process scores are not useful in predicting outcome scores and consequently the fourth hypothesis must be rejected.
Table 15
MERT-Process Correlations

<table>
<thead>
<tr>
<th>Variable Paired with MERT-Process</th>
<th>N</th>
<th>Kendall Correlations</th>
<th>Pearson Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback Letter</td>
<td>39</td>
<td>[ r = 0.22^* ]</td>
<td>[ r = 0.26 ]</td>
</tr>
</tbody>
</table>

\(^*p < 0.05\)
Additional Findings

Pretest/Posttest Gains

Though no formal hypothesis was made regarding the extent of the expected change in subjects' scores between pre and posttests, it was an assumption of this study that participants in general would show a significant gain in scores from the pretesting to the posttesting reflecting increased skills in the listing of pattern and process statements.

Paired T-tests on pre and posttest data were completed separately for pattern and process variables. Both tests revealed significant positive change in participants' scores from the pre to the posttest, with the pattern score yielding somewhat more statistically significant gains ($T=3.62, p=.001$) than the process gain scores ($T=2.27, p=.029$).

These results suggest that, as expected, participants in general tended to show an increase from pre to posttest in the number of pattern and process statements listed.

Relationships Between Dependent Variables

In Table 16, correlation coefficients for all dependent variables are computed by the Pearson Product Moment Correlation signified by "P". In addition, for correlations involving at least one variable with fewer than 5 values, Kendall correlations signified by "K" are also computed.

The table of correlations reveals that of the seven dependent variables, the two posttest measures, the feedback letter and the follow-up questionnaire, are generally positively related to the other
Table 16

Correlation Matrix of Dependent Measures

<table>
<thead>
<tr>
<th></th>
<th>Posttest Pattern</th>
<th>Posttest Process</th>
<th>Pre/Post Pattern Gain</th>
<th>Pre/Post Process Gain</th>
<th>End of Semester Questionnaire</th>
<th>Follow-up Questionnaire</th>
<th>Feedback Letter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Posttest Pattern</strong> K P</td>
<td>1.00</td>
<td>.13</td>
<td>.53***</td>
<td>.07</td>
<td>.09</td>
<td>.30</td>
<td>N=38</td>
</tr>
<tr>
<td><strong>Posttest Process</strong> K P</td>
<td></td>
<td>1.00</td>
<td>.09</td>
<td>.09</td>
<td>.13</td>
<td>.19</td>
<td>N=22</td>
</tr>
<tr>
<td><strong>Pre/Post Pattern Gain</strong> K P</td>
<td></td>
<td></td>
<td>1.00</td>
<td>-.04</td>
<td>-.21</td>
<td>.12</td>
<td>N=36</td>
</tr>
<tr>
<td><strong>Pre/Post Process Gain</strong> K P</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>-.04</td>
<td>.26</td>
<td>N=22</td>
</tr>
<tr>
<td><strong>End of Semester Questionnaire</strong> K P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>.48*</td>
<td>N=21</td>
</tr>
<tr>
<td><strong>Follow-up Questionnaire</strong> K P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.006</td>
<td>N=21</td>
</tr>
<tr>
<td><strong>Feedback Letter</strong> K P</td>
<td></td>
<td>.13</td>
<td>.19</td>
<td>-.21</td>
<td>-.04</td>
<td>.48*</td>
<td>N=21</td>
</tr>
</tbody>
</table>

*p≤.05; **p≤.01; ***p≤.001.
dependent variables. However, this is not so for the remaining three measures. In particular, the strongest relationships involving the gain scores are those with their respective posttests upon which they are based. These two correlations must, therefore, be ignored. In the case of the process gain score, there are no other significant relationships with other variables. In the case of the pattern gain score, the evidence is mixed with positive correlations and negative correlations. Similarly, the end-of-semester questionnaire is negatively correlated with the two gain score measures and positively correlated with the others, particularly the follow-up questionnaire. Because of the questionable validity of the gain score measures, the negative correlations with the end-of-semester questionnaire may be ignored in considering its validity. In sum, the posttest measures, feedback letter and follow-up questionnaire, appear adequately related to the other dependent measures of the study, while the follow-up questionnaire is only moderately related to most other measures and the gain scores are not sufficiently related to the other measures to justify their use.

Relationships Between Independent Variables

In the correlation matrix of independent variables shown in Table 17, Kendall correlations are provided for all variable pairs. In addition, Pearson correlations signified by "P" are provided in cases where both variables include more than 5 values.
Table 17
Correlation Matrix of Independent Variables

<table>
<thead>
<tr>
<th></th>
<th>MERT Pattern</th>
<th>MERT Process</th>
<th>ERT Summary</th>
<th>ERT Stage</th>
<th>Pretest Pattern</th>
<th>Pretest Process</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>K</strong> MERT Pattern</td>
<td>N=54 1.00</td>
<td>N=54 .07</td>
<td>N=54 .06</td>
<td>N=50 .29***</td>
<td>N=50 .04</td>
<td>N=50 .17*</td>
</tr>
<tr>
<td><strong>P</strong> MERT Process</td>
<td>N=54 .07</td>
<td>N=54 1.00</td>
<td>N=54 .08</td>
<td>N=54 .18*</td>
<td>N=50 .14</td>
<td>N=50 .02</td>
</tr>
<tr>
<td><strong>K</strong> ERT Summary</td>
<td>N=54 .06</td>
<td>N=54 .08</td>
<td>N=54 1.00</td>
<td>N=55 .39***</td>
<td>N=51 .10</td>
<td>N=51 -.16*</td>
</tr>
<tr>
<td><strong>P</strong> ERT Stage</td>
<td>N=54 .29***</td>
<td>N=54 .18*</td>
<td>N=55 .39***</td>
<td>N=55 1.00</td>
<td>N=51 .25**</td>
<td>N=51 .05</td>
</tr>
<tr>
<td><strong>P</strong> Pretest Pattern</td>
<td>N=50 .04</td>
<td>N=50 .14</td>
<td>N=51 .25**</td>
<td>N=51 1.00</td>
<td>N=51 .11</td>
<td></td>
</tr>
<tr>
<td><strong>P</strong> Pretest Process</td>
<td>N=50 .17*</td>
<td>N=50 -.16*</td>
<td>N=51 .05</td>
<td>N=51 .11</td>
<td>N=51 1.00</td>
<td></td>
</tr>
<tr>
<td><strong>P</strong> Pretest Process</td>
<td>N=50 .20*</td>
<td>N=50 -.26*</td>
<td>N=51 .03</td>
<td>N=51 .18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p ≤ .05
**p ≤ .01
***p ≤ .001
The findings reported in Table 17 reflect generally positive though weak correlations between independent variables. There are two noteworthy exceptions to this trend:

(i) The ERT stage score is more positively correlated with the other measures than any other variable. However, its .39 correlation with the ERT summary score must be partially discounted because the ERT stage score is based on the same raw data as is the summary score.

(ii) There is one significant negative relationship cited. This is the -.16 (K) or -.26 (P) relationship between the ERT summary score and the pretest process score. This negative relationship may indicate validity problems with either of these two measures. See Chapter 5 for further discussion.

Finally, attention should be drawn to the highly significant correlation between the ERT stage score and the MERT pattern (r=.29, p=.001). This relationship provides a basis for the assumption of construct validity of the MERT-pattern. That is, assuming that both the ERT stage score and MERT-pattern are designed to measure similar constructs, the validity of both measures is enhanced by a positive correlation between them. Though there exists a positive correlation between the ERT stage and the MERT-process (r=.18, p<.05), this relationship is a much weaker one than that with the MERT-pattern. Table 18 summarizes these relationships in greater detail.
Table 18
Distribution of MERT Scores by ERT Stage

<table>
<thead>
<tr>
<th>ERT Stage</th>
<th>Pattern Score</th>
<th>Process Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 1 2 3</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Pattern</td>
<td>1 10 17 3</td>
<td>16 9 5 1</td>
</tr>
<tr>
<td>Process</td>
<td>0 4 11 8</td>
<td>7 9 5 2</td>
</tr>
</tbody>
</table>
Relationships Between Demographic Measures and Outcome Measures

In addition to findings related to the four self-knowledge variables used in the study, correlations were computed to establish relationships between six secondary variables, such as age and sex of participants, and the outcome measures of the course.

The following correlation matrix (Table 19) presents findings relevant to these variables. Kendall correlations were computed for all measures except "age," where Pearson correlations are signified by "P".

Of the six variables, five appear to be significantly related to the dependent measures involved in the study. Findings pertinent to these five variables are reviewed below relative to each variable individually.

Professional/Academic Reasons

This motivation measure was positively related to three of five composite scores and one of the individual outcome measures at the .05 level of significance. Of particular interest is the correlation between the professional reasons measure and the follow-up questionnaire ($r=.44$). This is the strongest correlation between the follow-up questionnaire and any independent measure in the study. Because this motivation measure reflects to some extent the interest level of participants in taking the course, it is not surprising that there exists a strong correlation with the follow-up questionnaire, which reflects satisfaction and perceived learning in the course.
### Table 19
Demographic Measures: Correlations with Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Post Test Pattern N=44</th>
<th>Post Test Pattern N=43</th>
<th>Process Gain N=43</th>
<th>Process Gain N=43</th>
<th>Letter N=39</th>
<th>End of Semester Questionnaire N=44</th>
<th>Follow-up Questionnaire N=23</th>
<th>Composites N=19</th>
<th>Composites N=19</th>
<th>Composites N=36</th>
<th>Composites N=19</th>
<th>Composites N=19</th>
<th>Composites N=37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Reasons</td>
<td>-.10</td>
<td>.04</td>
<td>-.05</td>
<td>.10</td>
<td>.03</td>
<td>-.10</td>
<td>-.05</td>
<td>-.06</td>
<td>-.20</td>
<td>.02</td>
<td>-.13</td>
<td>.008</td>
<td></td>
</tr>
<tr>
<td>Professional/Academic Reasons</td>
<td>.10</td>
<td>-.07</td>
<td>.16</td>
<td>-.14</td>
<td>.08</td>
<td>.05</td>
<td>.44**</td>
<td>.33*</td>
<td>.44**</td>
<td>.11</td>
<td>.29*</td>
<td>.07</td>
<td></td>
</tr>
<tr>
<td>Lack of Purpose Reasons</td>
<td>.08</td>
<td>.23*</td>
<td>-.04</td>
<td>.29**</td>
<td>-.10</td>
<td>-.29**</td>
<td>-.22</td>
<td>-.28*</td>
<td>-.34*</td>
<td>-.11</td>
<td>-.30*</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>-.04</td>
<td>-.16</td>
<td>.08</td>
<td>-.20*</td>
<td>-.35***</td>
<td>-.28**</td>
<td>.10</td>
<td>-.26</td>
<td>-.35*</td>
<td>-.24*</td>
<td>-.31*</td>
<td>-.17</td>
<td></td>
</tr>
<tr>
<td>Experience</td>
<td>.37***</td>
<td>.20*</td>
<td>.03</td>
<td>.21*</td>
<td>.38***</td>
<td>.08</td>
<td>-.29*</td>
<td>.34*</td>
<td>.26</td>
<td>.43***</td>
<td>.21</td>
<td>.43***</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.14</td>
<td>-.15</td>
<td>-.22</td>
<td>-.15</td>
<td>-.24</td>
<td>.28*</td>
<td>-.05</td>
<td>.08</td>
<td>.14</td>
<td>-.08</td>
<td>-.08</td>
<td>.20</td>
<td></td>
</tr>
</tbody>
</table>

*(P)*: P<.05; **(P): P<.01; ***:(P): P<.001.
Lack-of-Purpose Reasons

This measure was only positively related (p < .05) to two outcome measures and one of these, the process gain score correlation, must be ignored (see discussion of gain scores). Of the remaining ten measures, four were negatively correlated and six showed no significant relationship to this measure. It must be concluded that participants who chose reasons designated as "lack-of-purpose" subsequently gained less from the course and were less satisfied with their experience than those who listed other reasons for enrolling in the course.

Sex

This variable has only two possible values: 1 and 2, representing female and male respectively. The consistently negative relationships between sex and ten of the twelve outcome measures in the course reflects the significantly stronger scores of women relative to men on these measures. These findings must be interpreted with caution, however, due to the relatively small sample size of men whose outcome scores were included in these computations. Specifically, the data for composite 1 and 2 includes the scores of only three men (compared to sixteen women). On the remaining measures, the sample size of men varied between four and six. The skewed sample sizes involved in this measure make it difficult to draw conclusions from the existing data.
Experience

This variable which reflects the amount of previous psychological education related experience of participants was positively related (p<.05) to seven of twelve outcome measures, four of which were significant to the .001 level. These statistics establish the experience measure as the single variable most consistently and significantly related to course outcomes. However, there was one negative correlation involving this measure. This was the relationship with the follow-up questionnaire (r=-.29). This finding may indicate that participants with considerable previous experience were not as enthusiastic about their experience in the course, nor as impacted by it, as were those who had less previous experience.

Age

The age variable, though not significantly related to most outcome measures was negatively correlated with the feedback letter and the pattern gain score though positively related to the end-of-semester questionnaire. Thus, scores on the feedback letter were higher for younger S's while scores on the end-of-semester questionnaire were significantly higher for older S's. This apparent discrepancy cannot be explained without the availability of additional data.

Multiple Regression Findings

In addition to computing correlations for each of the six secondary independent measures, these variables were included in a series of five stepwise linear regressions with all composite outcomes. The
four primary independent variables of the study as well as the "group" measure were also included in these regression equations as independent variables. The results of these regression equations are found in Table 21 (see Appendix C). In general, they corroborate the findings discussed above, with the exception of the lack-of-purpose motivation measure, which was not found to be a significant source of variance in any of the five equations. The professional reasons variable generally determined a significant portion of the variance of these composite measures (from 4% to 24%). Similarly, the experience measure was highly significant in three of the five regression equations, determining up to 23% of the variance, though not at all significant in the remaining two. Sex of participants accounted for 12% of the variance in composite 2 (though again only three men were included in the sample). Finally, the age of participants which revealed little consistent relationship to outcome in the correlation matrix accounted for approximately 6% to 16% of the variance in three of the regression equations. However, like the relationships in the correlation matrix, some of the R values associated with the age measure in the regression equations were positive while others were negative.

Other than the MERT-pattern, no other variable accounted for significant percentages of the variance in these regression equations.
CHAPTER V

SUMMARY AND CONCLUSIONS

Introduction

This chapter includes the following:

1. a summary of research findings.
2. a discussion of implications of the study relative to
   (a) the validation and elaboration of Self-knowledge Theory
   and related instruments, and (2) the clarification of the
   relationship between the foundations of psychological
   education and developmental theory.
3. a discussion of practical implications of the study rela-
   tive to the planning and design of psychological education
   interventions.
4. recommendations for future research.

Summary of Research Findings

The Experience Recall Test (ERT) and the Modified Experience
Recall Test (MERT) (pattern and process components) were administered

to the 55 participants of Education of the Self during the first class
meeting of this course. At the same time participants also completed
a pretest questionnaire (pattern and process components). At the
conclusion of the course four sources of outcome data (pattern and process posttests, end of semester questionnaire, feedback letter) were collected on those 45 participants who had completed the course and were present during the final session. In addition a follow-up questionnaire mailed to participants three months following the conclusion of the course was completed by 23 subjects. In all, five outcome measures were used to assess learning in the course. In addition seven composite and gain score measures were computed for data analysis purposes. Statistical tests involving each of these 12 outcome measures were completed for each of the four self-knowledge measures used: the ERT stage score, ERT summary score, MERT pattern score and MERT process score. Each participant (55) received a score on each of the four self-knowledge measures. A relatively small number of subjects (19) received scores on all outcome measures, though 47 of the 55 subjects received scores on some outcome measures. In addition all subjects in the study were given scores identifying their age, experience level, sex, and reasons for taking the course. These demographic measures were subsequently included in correlation and regression analyses with all outcome measures.

Each of the four hypotheses of this study involved one of the four self-knowledge measures: ERT-stage, ERT-summary score, MERT-pattern, and MERT-process. Hypothesis 1 which investigated relationships between the ERT-stage score and the dependent measures of the course revealed significantly positive correlations between the ERT-stage score and two of the five outcome measures, the posttest pattern score ($r=.19, p<.05$) and the feedback letter ($r=.40, p<.001$). The
positive correlation involving the feedback letter was further supported by the highly significant ($p = .0017$) results of the Chi-square analysis. In addition, a positive correlation ($r = .27, p < .01$) was found to exist between the ERT-stage score and one of the composite measures (composite 5) which combined the score on the two posttests with the rating on the feedback letter. The strongest relationship between the ERT-stage score and course outcome measures involved the feedback letter.

Because the feedback letter is a course requirement, completed by all students, it is perceived by students as part of the design of the course, and as a less contrived experience than the other outcome measures which are all essentially tests or questionnaires. The feedback letter is also a more representative sample of course performance than other measures because it is part of the course rather than a report of experiences in the course or a simulation of course work (as on the pre/post questionnaires). For these reasons, it can be argued that the letter rating is perhaps a relatively more important outcome measure than the other outcomes and should be weighted accordingly for the purpose of this study. Therefore, this finding of a highly significant relationship with the feedback letter suggests that at least with respect to performance on this measure, the ERT-stage score is useful as a predictor of success in the course.

Based on these findings, Hypothesis 1 was partially confirmed.

Tests of Hypothesis 2, involving the ERT-summary score, revealed no positive correlations between the summary score and any of the five
individual outcome measures. This hypothesis was therefore rejected as it was concluded that the ERT summary score is not useful as a predictor of outcome in the course, Education of the Self.

Hypothesis 3 concerned relationships between the MERT-pattern and the dependent measures of the course. A variety of statistical tests revealed that of the four independent measures, the MERT-pattern was the most strongly related to course outcomes. The finding of the MERT-pattern's relative predictive strength was primarily evidenced through the results of the five regression equations using composite measures as dependent variables and the four ERT and MERT measures as independent variables. In 4 of these 5 regression equations the MERT-pattern explained over 15% of the variance in outcomes. As expected correlation analysis (using Pearson correlations) revealed that the MERT-pattern was also significantly positively correlated with these composite outcomes (with r's ranging from .38 to .53) and highly correlated with scores on the feedback letter (r=.42, p<.01). Relationships between the MERT-pattern and other outcomes, though generally positive, were not significant at the .05 level. These findings represent a partial confirmation of the third hypothesis and suggest that the MERT-pattern may be of value in the prediction of success in the course Education of the Self.

It should be noted that the MERT-pattern correlation with the feedback letter (r=.39, p<.001) was almost identical to that found between the ERT-stage score and the feedback letter (r=.40, p<.001).*

*For purposes of illustration Kendall correlation coefficients are used for both measures.
For both of these two independent variables their relationship to the feedback letter was considerably more significant than their relationships to the other dependent variables. This finding may in part be explained by the relatively strong correlation between the MERT-pattern and the ERT stage score ($r=.29, p<.001$). It appears that because these two measures are correlated with one another, MERT-pattern correlations with outcome measures are in most cases roughly equivalent to ERT-stage correlations with the same measures (see Table 14).

Tests of Hypothesis 4 involving the MERT-process score revealed only one significant correlation with an individual outcome measure: the feedback letter. This correlation was not a particularly strong one, however ($r=.22, p<.05$).* Findings involving the MERT-process measure in general were not significant. Consequently it was concluded that the MERT-process measure is not useful as a predictor of outcomes in the course Education of the Self.

The strength of relationships involving the MERT-pattern in contrast to the relatively weak findings of the MERT-process measure may be due in part to either of the following reasons: (1) because the course Education of the Self is essentially designed for pattern level functioning, most learning in the course involved elaboration of the pattern stage. Consequently, the MERT-pattern measure which assessed subjects' ability to function at the pattern level might have been a more suitable indicator of learning in the course than the MERT-process measure.

*Using the Kendall correlation coefficient.
measure, (2) the MERT-pattern measure may possess greater construct validity than the MERT-process measure. Thus the contrast in findings may be due to problems inherent in the measurement of the MERT-process. This is conjectured because of the relatively stable nature of pattern responses compared to process level responses found on the pretest/posttest instruments. That is, over a period of three months pattern responses did not vary as much from pre to posttesting, as did process level responses. Two correlations help to illustrate this point: the correlation between the pretest pattern and posttest pattern measure ($r=.70$), and the correlation between the pretest process and posttest process measure ($r=.27$). These correlations reveal that while 49% of the variance in the posttest pattern score is explained by the pretest pattern score, less than 8% of the variance in posttest process scores is attributable to the pretest process score. This unusually low percentage of variance explained by the pretest process score indicates little consistency of scores on the process measure from pre to posttesting. Such fluctuations between pre and posttesting may reflect either reliability or validity problems associated with the instrument used or construct validity inadequacies of the process stage. Additional research should be undertaken in order to address these unanswered questions.

In addition to findings regarding the four hypotheses of the study, a number of related findings were also presented in Chapter IV and will now be summarized and discussed below.

Participants in general tended to show an improvement from pre to posttest on both pattern and process measures. This finding suggests
that the course Education of the Self may have resulted in a
general increase in participants' ability to describe patterns and
generate process level responses to them. Though no attempt was
made to determine whether stage change occurred for participants,
it seems likely that the gains in listing of pattern and process
level statements are reflective of the accomplishment of one devel-
opmental objective -- the elaboration of functioning within one's
present stage (horizontal decalage). It must be noted, however, that
because of the absence of a control group in this study, no claim
of a cause-effect relationship is made here. Further research is
needed to document whether the intervention rather than testing effects,
for example, may be responsible for the gains reported.

In addition, problems associated with the use of gain score
measures in this study suggest caveats in the interpretation of these
findings. In particular, both pattern and process gain scores were
relatively negatively correlated with their respective pretest scores.
This was particularly true in the case of the correlation between the
process gain score and the pretest process score ($r=-.52$, $p=.001$).
The pattern gain score was also negatively correlated with the pretest
pattern score, though not to such a degree ($r=-.23$, $p=.069$). These
negative correlations reflect the fact that generally higher pretest
scores allowed for minimal improvement on these two tests and conse-
quently relatively lower gain scores for participants with high pre-
test scores. Such a "ceiling effect" raises questions as to the
usefulness of this measure as an outcome variable in this study. As
shown by the correlation matrix of outcome measures in Table 16 the
gain scores are not generally positively related to other outcome measures and as such their value as indicators of learning in the course must be seriously questioned. This may help to explain why the correlations between independent variables (self-knowledge measures) and gain scores were generally so weak and often negative (see Table 14).

The "ceiling effect" problem associated with gain scores may limit the use of these particular measures as indicators of individual students' learning in the course. Thus these scores can not be used to determine for which students the course was most effective. However, the comparison of collective pretest scores with posttest scores (discussed above) still provides useful information relative to general learning trends in the population. Specifically, based on the findings that posttest scores in general were significantly higher than pretest scores it can be postulated that the course may have had a significant effect on subjects' pattern and process level skills. However, because of the problems inherent in the use of gain scores it is difficult to draw conclusions from the findings regarding relative and comparative gains between subjects or groups of subjects.

The matrix of correlations between independent variables reveals generally weak though positive correlations between variables (see Table 17). Though stronger relationships would have provided better evidence of construct validity for these measures, in only one case should serious doubts be raised as to the validity of measures used. In particular, the negative correlation between the ERT summary score and the pretest process score raises questions as to the validity of
these two measures. Additional data is needed, however, to draw conclusions regarding these findings. (Discussion of the use of the ERT summary score will be taken up in detail later in this chapter.)

As noted above, the correlation between the ERT stage and the MERT-pattern score is a highly significant one. This finding not only helps to explain the similarity of correlations involving these two measures, but also helps to establish the construct validity of both measures.

The matrix of correlations between dependent variables provides some evidence of construct validity for these measures. That is, because of the generally positive correlations between these measures it appears that they are measuring related aspects of a single construct. Only the use of the two gain scores warrants questioning. In this section, the limitations of these two measures have been discussed in detail. It has been suggested that a "ceiling effect" on pre and posttests may be influencing computation of gain scores. Accordingly gain scores may not be valid as indicators of individual learning in the course.

Of the several demographic measures used in the study as independent variables two were consistently and significantly related to outcome measures: (1) the experience measure which reflected amount of previous psychological education experiences, and (2) the professional/academic reasons measure which reflected participants' motivation for taking the course. These two measures appear to be particularly useful as predictors of success in the course Education of the Self. It should be noted that previous research in psychological
education has supported the second of these findings. Specifically, Alschuler (1973) in an achievement motivation program for adolescents found that subjects who expressed a pre-treatment "valuing" of achievement-oriented behavior had significantly higher achievement scores on posttests than did those who "valued" achievement less. Thus, a measure of commitment to course goals, like the professional/academic reasons measure in this study, may generally be predictive of learning or achievement in psychological education programs.

**Validation and Elaboration of Self-knowledge Theory and Related Instruments**

This section includes discussion of (1) construct validity of the ERT and MERT, (2) assessment of the utility of Self-knowledge Theory, and (3) recommended changes in design and scoring procedures of the ERT.

**Construct Validity**

Construct validity of the Self-knowledge Theory has been demonstrated in part through use of the Guttman Scaling Technique used to determine if stages were hierarchical and invariant. Self-knowledge stage has also been positively correlated with age and Loewinger's stages of ego development. Most recently construct validity was supported by Ziff's (1979) demonstration of a significantly positive relationship between self-knowledge stage as measured by the ERT and a person's ability to respond to stage-linked processing questions as measured by the Mirroring Questionnaire. The relationship between
these two instruments supports the view that self-knowledge level is a relatively stable and unified construct capable of being measured by different instruments which reflect the underlying construct.

The present study provides some additional support for validity of the Self-knowledge Theory. Through the demonstration of a positive correlation between the MERT-pattern and the ERT-stage \((r=.29, p<.001)\) another instrument in addition to the ERT was shown to be capable of measuring an aspect of self-knowledge development. It is not surprising that these two measures were positively correlated with one another, given that both reflect a subject's maximum self-knowledge capability. The relationship between these measures, though highly significant \((p<.001)\) was only moderately strong \((r=.29)\). However, it is difficult to achieve a strong correlation between variables when the range of data on one variable (self-knowledge stage) is so limited, including only pattern and process stages. It may be conjectured that the relationship between these measures might be stronger with the addition of data from all four self-knowledge stages. Nevertheless, the findings of a positive relationship between these two measures are particularly useful in an exploratory study of this nature. Further research must be undertaken to determine the extent to which the MERT-pattern and MERT-process are related to the ERT-stage when elemental and situational scores are included in the data base.
Utility of Self-knowledge Theory

Self-knowledge Theory has been shown to be of use in providing guidelines for the design of human relations training exercises (Ziff, 1979). It has also been argued that the theory can be used effectively in the design of psychological education interventions in general (Phillips, 1980; Alschuler, Phillips, Weinstein, 1977; Ziff, 1979). The findings of this study lend partial support to this perspective. However, problems in the use and interpretation of self-knowledge measures serve to limit access and may limit the potential utility of the theory. Because the use of the ERT requires extensive training, and the administration and scoring of the test involves complex and time-consuming procedures the use of self-knowledge instruments and measures will probably remain limited.

In addition, efforts to establish a clear relationship between ERT profile scores and summary scores remain incomplete. The use of criteria for interpreting scores has also not been established. Until guidelines for the clarification and interpretation of ERT measures are established and validated, the utility of the ERT will remain limited, perhaps also effecting the utility of Self-knowledge Theory in general.

Recommended Changes in Design and Scoring Procedures of the ERT

The findings of this study have several implications for the future use of the ERT particularly with regard to design and scoring procedures.
Recommended changes in the ERT are in part based upon the following findings:

1. The ERT summary score showed no significant relationship to any outcome measure. In addition, with the exception of its relationship to the ERT stage score which is based upon the same raw data as the ERT summary score, the summary score was not significantly positively related to any independent measures.

2. The ERT stage score was the single independent measure used which was significantly and positively related to most other independent measures as well as to two of the five individual outcome measures.

3. The MERT-pattern score was the independent variable most strongly and positively related to most outcomes in the course.

In addition to the above findings, Ziff (1979) has noted that there are problems inherent in the use of the ERT summary score which utilizes all codable responses to all five questions of the ERT. The major problem identified by Ziff is that each of the five questions of the ERT elicit the use of processes associated with progressively higher stages. The questions of the ERT are listed below for illustrative purposes.

1. Describe as fully as you can and in as much detail the experience you remembered. (Please include what led up to this experience, what your thoughts and feelings were, and what the results of this experience were.)
2. How was the experience important or special to you then?
3. How is the experience important or special to you now?
4. From the experience you just remembered, please describe some things you know about yourself now.
5. How could knowing this about yourself be useful to you? Specifically, how can it help you get what you want or avoid what you don't want?

The first three questions seem designed to elicit elemental and situational responses, while questions 4 and 5 may be most appropriately answered by using pattern or process level responses. Because most respondents tend to write considerably more on questions 1 through 3 than on 4 and 5, the test is biased toward elemental and situational responses. In fact a small percentage of respondents in the present study did not finish the first three questions and so never answered questions 4 or 5. For these subjects, as well as for those who wrote detailed responses to the first question, the great majority of responses were elemental and situational.

Another factor which may contribute to the use or absence of higher stage level processes in responding to the ERT is the content of the incident chosen for recall. Though the existence of this relationship has not been formally researched, a preliminary review of protocols in the present study suggests that content may influence scoring of protocols. In particular, protocols which involve an interpersonal dilemma or conflict seem to provide more opportunities for pattern and process responses than those which involve memorable "events" such as first dates, parties, trips, car accidents and the
like. Also, respondents sometimes recall incidents which principally involve others. In such cases the respondent is an observer of an external event. In all such cases, the last question on the ERT "How could knowing this about yourself be useful to you?" is difficult to answer in any way (and sometimes left blank). In general positive memories seem to inspire fewer process level responses than memories of painful experiences which may have been the result or precursor of a significant change or decision. Since, at the process level, some internal change must be attempted, it appears that some form of dissonance or dissatisfaction with oneself or others is essential to the generation of process level responses. Pattern level responses, on the other hand, apparently can be elicited somewhat more easily and so appear to be less subject to the limitations cited. If, however, the frequency of pattern or process responses is to any extent influenced by the variables discussed, the validity of the ERT must be questioned. In this study the suggestion of these limitations is offered only as conjecture. It is recommended, however, that additional research be undertaken to more adequately address this question.

It has been suggested that at least three factors unrelated to an individual's ability to utilize self-knowledge related processes may effect his/her ERT summary score: (1) the order of questions posed and the relative emphasis on them, (2) the respondent's writing style (e.g., degree of descriptive detail), and (3) the content or type of incident chosen to discuss. These factors which affect the scoring of the ERT are highlighted by the use of a summary score in which all responses are used to calculate the score. On the other hand, the
ERT-stage score which in this study is based on the single highest stage response in a given protocol is not likely to be as affected by these factors. On this measure the number or percentage of responses at various stages is not included in the calculation of the score. Therefore the factors mentioned could only affect the stage score to the extent that they inhibit the use of all pattern or process responses. For only if there are no process responses or no pattern responses would the stage score be affected. It does not appear that this effect is taking place given the findings that in this study all protocols had at least one pattern response and over 40% had one process response. Thus the summary score appears to be more subject to the limitations cited than the stage score.

If it is the case that these limitations of the ERT are having a greater effect on the summary score than on the stage score then this may help to explain the discrepancy between the relatively strong correlations involving the ERT-stage score and the relatively weak correlations involving the summary score. This conclusion, though somewhat speculative at this point, helps provide direction for future research (to be discussed later in this chapter) and contributes to a rationale for recommendations in the design and scoring of the ERT (below).

The design of the ERT could be improved in several ways. First, directions to the test could specify a particular type of experience to recall (as is done on the MERT). As a result of such a modification a respondent's choice of subject matter which may not be appropriate to process level responses is mitigated against. Second, to provide
a more balanced emphasis on all questions, responses could be timed to insure that respondents are given ample time to address each question. Third, it has been previously recommended (Ziff, 1979) that stage-associated questions designed to elicit a specific stage response such as those used in the Mirroring Questionnaire or the MERT might be used in place of the more general questions asked on the ERT. Such a change in the level of specificity of questions asked would probably have the effect of encouraging stage-specific self-knowledge processes. Scoring of responses could be accordingly simplified with each response scored in relation to the stage criteria of the question asked (as on the MERT or the MQ).

Additional changes in the scoring of the ERT might include the use of qualitative criteria by which more than one point could be awarded for an elaborated stage-appropriate response to a given question. Additional points could be given for the degree of differentiation of pattern statements which, for example, reflect more than a single internal state (as on the pre/posttest). In this way subtle levels of developmental growth (elaboration of a stage) could be more accurately measured than is possible at the present time.

Finally, the findings of this study generally corroborate Ziff's (1979) conclusions that the stage score is a more useful measure than the summary score in the prediction of the maximum capability of a person in responding to psychological education interventions. In fact both the MERT-pattern and the stage score were significantly more useful in predicting outcome in Education of the Self than was the summary score. Of course both of these measures were intended to reflect
maximum capability, whereas the summary score is designed to measure the spontaneous use of self-knowledge processes. Though both approaches to assessment are useful under different conditions, in this instance the capability of a person seems to be more strongly associated with performance on related measures than is the spontaneous usage measure. The adoption of such "capability" measures is recommended for future research purposes. The use of these measures not only simplifies the coding and scoring procedures of self-knowledge instruments but enhances the utility of Self-knowledge Theory in general by legitimizing the use of measures which can be used successfully to predict performance on related outcome measures.

Clarification of the Relationship Between the Foundations of Psychological Education and Developmental Theory

The need for a developmental theory base to psychological education has been espoused by many theorists (Alschuler, Phillips, Weinstein, 1978; Mosher & Sprinthall, 1971, 1970; Skovholt, 1974) in response to criticisms (Rest, 1974) and limitations of research in the field (Alschuler, Phillips, Weinstein, 1977) previously cited (see Chapter I, p. 5). Though a number of developmental studies have been reviewed which individually address some of these issues (Mosher & Sprinthall, 1970, 1971; Erickson, 1975; Stuhr & Rundle, 1980) few studies utilize developmental theory to the extent necessary to respond to all of these problems.
The current study, however, provides an example of a comprehensive application of developmental theory to psychological education. The study involved the use of a program whose goals and sequence of activities are developmentally based and matched to the general developmental level of the population. In addition, through post hoc matching of the program to subjects' developmental stage, a more specific test of the relative effectiveness of the program for matched and unmatched subjects was completed. The incorporation of these developmental components in this study are useful in attempting to respond to the limitations (cited in Chapter I) of previous research. In particular this study (1) utilizes a curriculum whose goals are developmentally derived from Self-knowledge Theory and which are theoretically sound and measurable, (2) matches the curriculum both at a general and specific level (post hoc matching) to student developmental level, (3) incorporates a curriculum which reflects developmental theory (Self-knowledge Theory) in its sequence of activities and processes, (4) reveals possible developmental stage elaboration (inferred from gain scores), (5) utilizes constructs and instruments based upon program goals and accordingly developmental stage criteria (of Self-knowledge Theory).

In these ways this study suggests that developmental theory can be useful in the development of psychological education programs. However, the question of whether psychological education should be based in developmental theory remains unanswered. A thorough examination of this subject may involve considerable research including studies like this one which reflect developmental theory in program
goals, curricular sequence, outcome measures and instruments, and the matching of the program to the population. Though the findings of this study are inconclusive, the study provides an example of developmentally-based evaluative research. Hopefully this example will be of use to future related efforts designed to clarify the relationship between developmental theory and psychological education.

Practical Implications for the Planning and Design of Psychological Education Programs

The present study was initially undertaken in an effort to address both problems of theory and practice in psychological education. Many of the findings of the study and discussion of them to this point have dealt with theoretical implications. The following discussion of practical implications is therefore presented in an effort to specifically address problems of practice, as well as to further efforts in the translation of theory to practice in psychological education.

These implications are presented tentatively given both the exploratory nature and the inconclusive findings of this study.

Implications for a Matching Model Approach to Psychological Education

The review of the literature presented in Chapter II showed that the effectiveness of psychological education approaches often depends upon the extent to which a treatment (E) is suitable for a particular
population (P) in achieving a desired outcome (B). The BPE model was used in the review to provide a framework for investigation of the use of differentiated variables (B,P,E,) and of matching found in previous related studies. Though a number of studies incorporated the use of differentiated variables and the matching of them, few were specifically designed as illustrations of a matching model approach to psychological education. The design of this investigation provides such an illustration of matching model research.

The following features of this study are based on a matching model approach:

1. Use of a developmentally based curriculum designed for a specific population (pattern level adults);
2. Pre-treatment assessment of participant self-knowledge level;
3. Identification of demographic data for all participants;
4. Use of five individual outcome measures;
5. Post-hoc differentiation of participants based on self-knowledge measures as well as demographic data;
6. Data analysis procedures designed to determine which population subgroups were most successful given this particular treatment in accomplishing each of the course objectives.

Because the population consisted only of pattern and process level participants (according to the ERT stage score) all subjects were more or less matched to the treatment, functioning at the treatment stage or one stage higher. A more representative population sample (including situational subjects) would have provided for participants matched and unmatched to the treatment. Such conditions
might have provided more useful data from which to base conclusions regarding the relative effects of using treatments matched and unmatched to the developmental level of a population. To a limited extent however, the MERT-pattern provides some data on participants matched and unmatched to the treatment. That is, because the MERT-pattern provides a relative score (ranging from 0 to 3) of subjects' pattern level ability, it may be assumed that subjects with low (0-1) MERT-pattern scores were relatively unmatched to the treatment, while subjects with high (2-3) scores were matched. Extrapolating then from the findings on the MERT-pattern, it may be concluded that matched subjects did in fact have significantly higher outcome scores (particularly on the feedback letter) than did unmatched subjects. The use of a matching model approach in the design of psychological education programs is to this extent supported by the findings of this investigation.

In addition to matching the treatment (E) to the developmental level of participants (P) several other variables may be employed in the differentiation of the person. For example in this investigation, previous experience and reasons for enrolling in the course were both found to be related positively to participants' performance in the course. Accordingly such variables as these may be used as a basis for differentiating the population and as a basis for matching the population to a given treatment. It may be the case that only certain kinds of psychological education programs differ in their effectiveness in relation to participants' previous experience. A matching model approach to research may be essential in determining for which
programs effectiveness is enhanced by previous experience and for which effectiveness is diminished. The practitioner then can use this information as a basis for designing or redesigning programs to match to a given population, selecting personnel and screening participants accordingly.

In some cases the focus of matching model inquiry is on the identification of population characteristics or outcomes which are best matched to a given intervention. Here the intervention is a "constant" with some populations and goals better matched to it than others. The question asked is "For whom is this intervention best suited and toward what end?" In other instances the researcher or practitioner may consider the population to be the constant as efforts are directed at developing a curricular approach (or modifying an existing one) best matched to the population. In this case the question is "What intervention and what goals are most appropriate for this particular population?" For both types of inquiry, a matching model approach could prove useful.

In addition to using a matching model approach to identify treatments best suited for a given population, Ziff (1979) has shown that a matching model approach can be used effectively to match kinds of processing questions to people at different developmental stages. His study revealed that a significant relationship exists between a person's self-knowledge stage and his/her success in responding to processing questions. Ziff further suggests that other aspects of a given intervention, for example the structure and content of a given
activity, and the introduction or directions given to it, might also be differentiated according to self-knowledge level. The use of these treatment components differentiated by self-knowledge criteria provides additional evidence and examples of the variety of matching approaches possible utilizing developmental theory as a basis for differentiation.

Though the review of the literature suggests that few efforts have been made to utilize other developmental theories in matching model approaches to psychological education, the possibilities appear limitless. In each case the stage criteria of the developmental theories provide a basis for planning interventions designed to facilitate or match development of a particular stage. For example, interventions designed for participants assessed at Loevinger's conformist stage (Ego Development Theory) could reflect this stage in its content by addressing participants' feelings and fears around approval/disapproval—a powerful sanction at this stage. The process or format of interventions might also be designed according to specific stage criteria. For example, Selman's interpersonal developmental theory might be utilized through incorporating appropriately designed role-playing activities for children functioning generally at the third stage (third person perspective-taking). A third way in which the developmental stage needs of the population can be reflected in the design or implementation of a program is in the group leader's use of the criteria of a given stage in the establishing of climate, norms and guidelines for interaction. Moral Developmental Theory is particularly well-suited for this purpose. The stages reflect the development of values and
motivation as well as the basis for moral judgments. Thus, for example for participants at stage 4, authority-maintaining morality, clear definitions of hierarchical roles and rules might enhance the effectiveness of any curriculum.

Such applications of developmental theories to a matching model approach provide an array of developmental variables each differentiated according to a set of unique stage criteria. In addition, other variables which are not based in developmental theory have been shown to be useful in matching model approaches both in this study as well as in others cited in the review of the literature. Some of these variables are listed within the framework of BPE analysis in Table 20. Though the list is by no means exhaustive, it provides an overview of the range of matches possible in psychological education.

The BPE framework presented can be used to formulate a myriad of matches insuring that a particular treatment (E) is specifically designed for population characteristics (P) to achieve a desired goal (B). The chart includes both developmental and non-developmental variables. In many instances the non-developmental variables are not capable of being matched in so straightforward a manner as are the developmental variables. Though all of these examples of non-developmental variables can be used in matching B, P, and E components, certain combinations of these variables result in more useful and meaningful matches than other combinations. Thus, for example, there may be little basis for matching a population differentiated by the previous experience of the participant to treatments varied according to
Table 20
Matching Model Variables Found in Psychological Education

<table>
<thead>
<tr>
<th>(B) BEHAVIOR Developmental Outcomes</th>
<th>(P) PERSON Structural Developmental Variables</th>
<th>(E) ENVIRONMENT Developmental Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>-developmental change, i.e., stage change</td>
<td>-self-knowledge development</td>
<td>-stage-appropriate intervention</td>
</tr>
<tr>
<td>-developmental change relative to a single content area: e.g., sexual issues</td>
<td>-moral development</td>
<td>-stage-appropriate introduction to intervention</td>
</tr>
<tr>
<td>-elaboration of a stage</td>
<td>-ego development</td>
<td>-stage-appropriate structure or content of an intervention</td>
</tr>
<tr>
<td></td>
<td>-cognitive development</td>
<td>-stage-appropriate processing</td>
</tr>
<tr>
<td></td>
<td>-perspective taking development</td>
<td>-stage-appropriate norms and rules</td>
</tr>
<tr>
<td></td>
<td>-conceptual level development</td>
<td>-developmentally sequenced curriculum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-developmentally based curricular content</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-developmental Outcomes</th>
<th>Non-developmental Variables</th>
<th>Non-developmental Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>-optimum learning from experience</td>
<td>-degree of experience</td>
<td>-experiential vs. non-experiential format</td>
</tr>
<tr>
<td>-successful response to processing questions</td>
<td>-type of motivation</td>
<td>-high vs. low risk</td>
</tr>
<tr>
<td>-improvement in test scores</td>
<td>-age</td>
<td>-degree of student interaction</td>
</tr>
<tr>
<td>-classroom appropriate behavior</td>
<td>-internal/external locus of control</td>
<td>-use of academic subject matter</td>
</tr>
<tr>
<td>-decrease in recidivism rate</td>
<td>-sex</td>
<td>-heterogeneous grouping</td>
</tr>
<tr>
<td>-degree of group interaction</td>
<td>-grade level</td>
<td>-parent involvement</td>
</tr>
<tr>
<td>-self-concept enhancement</td>
<td>-self-concept assessment</td>
<td>-hypothetical or &quot;real life&quot; conflicts</td>
</tr>
<tr>
<td></td>
<td>-profession</td>
<td>-use of the community or culture</td>
</tr>
<tr>
<td></td>
<td>-socio-economic status</td>
<td>-teacher-led vs. leaderless</td>
</tr>
<tr>
<td></td>
<td>-sub-cultural identity</td>
<td>-clear definition of rules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-leader style</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-leader's experience</td>
</tr>
</tbody>
</table>
the degree of parent involvement. However, groups differentiated by previous experience of participants might be beneficially matched to treatments varying in degree of risk, or treatments differentiated by the leader's style. A number of useful questions could be addressed through such matching model applications. The effectiveness of such matches could be further enhanced by using two or more outcome measures such as elaboration of self-knowledge stage, and self-concept enhancement to determine whether a particular outcome is an appropriate goal of a given intervention for a particular population. The use of a developmental outcome might be further differentiated by utilizing stage criteria associated with the stage of the participants. For example, for subjects at the situational (self-knowledge) stage, program goals defined according to stage criteria might include learning to describe more completely internal states and consequences of actions. For participants at the pattern stage, as in Education of the Self, programs could be designed to enhance individuals' abilities to describe their internal patterns with increasing detail and sophistication. The use of such goals could be particularly valuable in planning programs which are specifically matched to the developmental needs of a population. By following such a procedure in the design of research or practice in psychological education, not only may effectiveness of current programs be improved, but the direction of future research will be enhanced as research findings provide information regarding effective matches between treatment, populations and goals in psychological education.
One such curriculum development procedure which uses developmental goals as a framework from which to design programs might begin with a survey of psychological education programs and strategies. The stage criteria could be used to determine which approaches are most appropriately matched to various developmental goals. Approaches which reflect the criteria of a particular developmental stage could be grouped accordingly. Programs could be surveyed to insure that components or approaches included reflect some degree of consistency relative to the stage criteria reflected in both content and process of the program. A variety of ways to catalogue programs and strategies according to such guidelines as these have been discussed in detail as part of a set of recommendations proposed by Ziff (1979). Here it should only be pointed out that the use of stage criteria in determining program goals can be instrumental in a matching model approach designed to enhance the effectiveness of the match between treatment (E) and population (P).

The need for a more comprehensive matching of B, P, and E variables has been discussed above. In addition, matching model applications of developmental theory may be improved upon through delineation of developmental stages. For example in the present study a more detailed delineation of the pattern stage is suggested by the range of responses to the pre/posttest. Though most participants were able to list three or more pattern statements on this measure both before and after the intervention, there was a considerable disparity between the least differentiated pattern statements and the most differentiated. For some subjects internal life was characterized
by such awarenesses as "When I sweat I feel awful until I take a shower." For others, pattern statements typically included references to carefully articulated thoughts and feelings and often self-reflective attitudes about internal states (meta-patterns). All participants, however, scored at least at the pattern stage on both ERT and MERT instruments. Thus at least according to these measures all subjects functioned at the pattern stage (though some only minimally) and thus were relatively matched to the intervention. On the other hand, the detailed responses obtained on the pre and post-tests revealed that subjects functioned at distinctly different skill levels within the pattern stage. Based on these findings it would seem that the pattern stage may consist of a number of related competencies forming a continuum of differentially developed skills. Thus, for example, some pattern stage subjects may be able to identify classes of situations which they react to, but tend to emphasize external responses. Others may be skilled in monitoring internal states but have difficulty in forming generalizations about their behavior. This view of stage movement in relation to the pattern stage has implications for the design of psychological education programs. For example, the specific skills which make up patterned thought could be used to form a progression from least developmentally advanced to most advanced. Such a developmental sequence provides the basis for a series of mini-stages within the pattern stage (see Ziff, 1979, appendix). These mini stages could be used for evaluative or assessment purposes as well as to enhance the precision of match between B, P, and E
components. Such a differentiation of the pattern stage might lead to the following possible sequence of pattern stage competencies:

a. ability to describe two or more stable internal thoughts or feelings in response to a specific class of situations;

b. ability to describe several different types of situations or contexts, each associated with typical internal responses to them;

c. ability to describe several alternative internal responses to various classes of situations.

These competencies could be used as the basis for developing differentiated approaches (E) to a curriculum such as Education of the Self. In order to incorporate these competencies into a matching model approach, participants might be informally pretested according to these specific developmental competencies and placed into any one of three groups emphasizing, respectively, competency a, b or c. The approach designed to address the first competency might primarily include opportunities for learning about one's thoughts and feelings. Some form of counseling or an "encounter" experience might be particularly effective. For participants working on competency b, a number of structured activities may be the most beneficial approach. For participants who have mastered a and b and are ready to work on c, a more cognitive approach may be most useful. For example, programs emphasizing this competency might stress such strategies as the clarifying of responses, brainstorming, and evaluating alternatives. In the development of each competency, it is further recommended that programs incorporate considerable modeling of the skills involved as well as opportunities
across a variety of content areas for participants to practice use of these skills. In this way the use of multiple goals or competencies and correspondingly differentiated programs may provide for a more effective and comprehensive match between participants and programs in turn helping to promote learning and development at any point within the pattern stage.

The Role of Dissonance in Design of Psychological Education Programs

Several participants in this study commented on questionnaires that the patterns that they chose to work on were not as provocative as they might have been. In such instances it appeared that participants' learning and motivation in the course might not have been at an optimum level. The potential value of incorporating dissonance-producing questions in self-knowledge instruments such as the ERT or the MERT has been discussed above. In addition, it may be of equal value to the design of psychological education programs to incorporate opportunities for experiencing cognitive dissonance whenever possible or appropriate, particularly if the goal of an activity is to generate process level responses. For many subjects, specific activities such as the "Trust Walk" or a guided fantasy may not be capable of producing dissonance and so may provide a poor basis for exploring process responses. If on the other hand, such activities are used only to generate patterns, then they may be very effective and appropriate for this purpose. Once patterns are identified with no dissonance surrounding them, however, they may be of limited future use as a basis for process level inquiry. For this reason, an individual's
choice of a personal pattern to work on should be closely monitored to insure that the pattern chosen provides opportunities for naming dissonant responses.

Implications for Screening and Admissions Policies

The findings of this study may also have implications for admissions policies both with regard to individual psychological education courses or programs such as Education of the Self as well as for advanced degree and certification programs involving extensive training and/or course work in psychological education. On the basis of the findings of this study students entering a program such as Education of the Self are more likely to benefit from the course if they either (1) have considerable previous experience in counseling or psychological education related programs, (2) have clearly defined academic or professional goals for taking the course, or (3) have well developed pattern level skills. Any or all of these apparent predictors of success in Education of the Self might be useful as admissions criteria either for individual courses or for larger programs. To some degree a student's background in psychological education as well as his or her professional goals are typically used as criteria for admission into psychological education degree programs. However, these criteria are rarely used in the screening or admission of students to individual psychological education courses or workshops. The assumption appears to be made that a student's background and goals, though essential to success in a leadership role in psychological
education, have little bearing on his/her success or learning in a particular course or workshop. If this assumption is accurate, it is worth questioning. In psychological education courses which require a high degree of student participation (e.g., Education of the Self) each student contributes to the experience of all other students. Thus if a course is inappropriate for an individual student, not only does that student suffer, but indirectly the experience of others may be adversely affected as well. The use of an admissions procedure which screens out of such programs those students with little previous experience and poorly defined goals may protect many students from experiences they are not prepared for while also perhaps improving upon the overall effectiveness of the course, and enhancing the level of enjoyment and involvement experienced by most course participants.

With respect to participants' pattern stage competencies some minimal standard could also be devised as a basis for screening of students. For such a purpose perhaps a test which requires listing of patterns, such as the pretest (pattern), could be used to determine a student's readiness. In addition this type of pretest might be used as a basis for assessing a student's "mini-stage" and perhaps also for developing matched goals and curricula as discussed above.
Recommendations for future research fall into two general categories: research which would be useful in furthering the theoretical goals of this study, and design modifications which would improve upon the present study and provide more useful data from which to draw conclusions.

Possible areas of future research include: (1) applications of developmental theories to matching in psychological education, (2) main effects studies comparing effectiveness between developmental approaches to psychological education with non-developmental approaches, (3) exploratory studies utilizing Self-knowledge Theory and instruments, and (4) research exploring factors which may contribute to success or effectiveness of psychological education programs.

It has been pointed out in the review of the literature that little attention has been paid to such developmental guidelines as day-to-day sequencing of activities and pre-treatment developmental matching of populations to interventions. The present study is one of few studies available which attempts to incorporate these guidelines. In addition, a number of alternative approaches to utilizing matching principles have been discussed in detail in this chapter. Further studies might also incorporate the matching of other psychological education programs and approaches to specific developmental stages associated with various developmental theories. In this way it might be possible to determine to what extent a particular program is an effective match for a particular population. For example, it might be useful to attempt to
match the moral developmental level of students with a variety of approaches used in the teaching of oppression to determine whether moral development of students is an important factor in the success of such programs. Similarly the appropriateness of assertiveness training programs may be researched through matching approaches to varying levels of students' ego development. Obviously research possibilities in this area are limitless. Such studies have value in two ways. First, developmental research can ultimately lead to improvements in the effectiveness of given programs by insuring the optimum match with participants perhaps through some form of screening or tracking of students. And second, this type of research helps provide direction and guidelines to curriculum or program development by leading to modifications of content, structure, and even teaching style in order to provide a developmentally appropriate experience for the learner.

Once program design and implementation have been further refined in accordance with developmental criteria (discussed in Chapter II) a variety of comparison studies might be useful. For example studies might compare the effectiveness of a developmentally based psychological education program matched to the developmental level of the population with a non-developmentally program involving a similar population. In this way the merits of utilizing a developmental theory base in psychological education could be easily demonstrated. Studies of this sort should include populations which reflect different age groups such as preschool-aged children as well as adults, various ethnic and cultural backgrounds, and variations of socioeconomic status.
Comparison studies might also compare effectiveness of incorporating different developmental features in given programs. For example, programs such as Education of the Self might be taught with and without pre-treatment determination of self-knowledge level or with and without the use of +1 modeling or optimum sequencing of approaches. Findings of these studies might be of use in determining the relative effectiveness of specific developmental approaches.

The present study has furthered the research efforts of Ziff (1979) in the development of an alternative self-knowledge instrument (MERT). However, while the MERT-pattern was found to be highly reliable and also positively related to several of the outcome measures of the course, the use of the MERT-process measure resulted in few significant findings. Further research involving either of these components of the MERT should attempt to determine whether the effectiveness of either of these measures as assessment tools for matching subjects' self-knowledge level with interventions may be dependent upon the stage orientation of the intervention. Thus, perhaps the MERT-pattern is a more effective measure when used with programs which are predominately oriented towards the pattern stage. The MERT-process may be of greater use in matching models associated with process level interventions.

Future studies might also be undertaken to explore possible refinements in the use of the ERT discussed earlier in this chapter. A clarification of the relationship between stage scores and summary scores would be of use in interpreting data and could be accomplished through studies involving larger sample sizes and age ranges than
were incorporated in the present study. The lack of temporal validity data for the ERT poses additional problems in interpreting change scores in individual or group self-knowledge level which might be otherwise attributed to the effects of a specific intervention. Until such baseline data is available, studies which attempt to demonstrate self-knowledge stage gains will be difficult to evaluate.

Finally, difficulties in the present study associated with the use of process stage measures (MERT-process, process-gain score [pre and posttest], ERT-summary) suggest the need for further refinement of coding criteria for the process stage, or for research to further validate the construct of the process stage. The findings of the present study have raised questions regarding these issues, which cannot be adequately addressed without further research involving larger populations and a broader age range.

Finally, this study presented exploratory data relevant to the identification of factors which may contribute to the effectiveness of psychological education programs. However, the two "demographic" measures used which showed significant relationships to outcome measures were not tested for reliability or validity. In order to further support the general implications that either previous experience or reasons for enrolling in a program may be related to participants' performance in a psychological education course, additional research must be undertaken to insure that such instruments and measures used possess construct validity and coder and temporal reliability.

Other variables have also been shown to affect participant performance and learning in psychological education programs (see
Chapter II). Further research is needed to determine specifically under what conditions, for which populations and programs these variables affect course outcomes. In addition, exploratory studies like the present one will be useful in continuing to identify other variables which may prove useful in providing the most appropriate match between population (P), intervention characteristics (E), and program objectives (B).


McClelland, D. C. What is the effect of achievement motivation training in the schools? Teachers College Record, 1972, 74, 129-145.


APPENDIX A

DESCRIPTION OF THE INTERVENTION:

EDUCATION OF THE SELF
The following description of the Education of the Self curriculum is based on Weinstein's (1981) article *Self-Science Education* and the trainer's manual *Education of the Self* (Weinstein, Weinstein, Hardin, 1976).

Education of the Self developed by Gerald Weinstein is a course that has been taught to graduate and undergraduate students at the University of Massachusetts/Amherst for the past eleven years. It represents years of trial and error revisions and reorganizations, as well as the synthesizing of different therapies and psychological tenets.

Though the course was developed before research into Self-knowledge Theory had established the existence of specific stages of self-knowledge, the course is principally designed to help participants identify and subsequently "treat" dissonant patterns. For this reason the course is particularly well suited for pattern level subjects. The list of course goals below illustrates the course emphasis on pattern identification:

1. Students will observe and make an inventory of certain aspects of their own internal responses and external behaviors and clearly identify their patterns of response.

2. Students will elaborate on both the positive and negative consequences of particular response patterns.

3. Students will identify the personal/social history of certain of their response patterns.

4. Students will design and implement experiments on dissonant or ineffective response patterns to see if such experiments yield more positive consequences.

5. Students will evaluate and choose alternative responses to personally dissonant situations.
6. Students will utilize various cognitive/affective models for "tracking" and "treating" dissonant patterns.

To facilitate the accomplishment of these goals, counseling principles and techniques derived from such counseling models as Rational Emotive Therapy, Transactional Analysis and Re-evaluation Co-counseling are presented during the first part of the semester. In addition, the "Trumpet" (described below in detail), the basic organizer of the course used to facilitate personal problem-solving, is introduced at this time. Each student's personal investigation of a dissonant pattern is organized and enhanced through use of the "Trumpet." According to Weinstein, the Trumpet "...is the most comprehensive available tool for defining, analyzing, and revising students' self-hypotheses" (Weinstein, 1976, p. 10).

The Trumpet process consists of eight distinct steps which are outlined below:

1. Confrontation--The confrontation is the experience or event which is used as a source of data for further exploration. The experience may be a simulation or a game, or an actual life occurrence such as "a recent rejection."

2. Making an Inventory--Students examine their responses to a given confrontation through reflecting on behaviors, thoughts, feelings, and sensations which occurred during the confrontation.

3. Pattern Identification--During this step of the Trumpet process, students attempt to find similarities or consistencies in the ways they respond to similar situations. Accordingly, patterns are described in the following form:

   Whenever I'm in a situation where (conditions) ______, ______, I usually (behaviors) ______, ______. I experience feelings of ______, ______, ______. The sentences that pass through my mind are ______, ______, ______.
4. Function--During this phase of the Trumpet process students are directed to determine what their pattern helps them get and what it helps them avoid. For example, not volunteering in class may help a student avoid feeling stupid or foolish or avoid feeling judged by others.

5. Consequences--Students now assess the "cost" of the pattern. Whereas the function of the pattern is essentially how the pattern serves the person, the consequence is what the person pays for these services.

6. Experimenting--If a student finds that she is paying too great a cost for the safety offered by the pattern she may wish to explore some alternative responses.

7. Evaluation--The evaluation of the experiment is discussed with each student's assist group. Accordingly, changes in the design of the experiment may be made at this time.

8. Choice--The student is now able to choose among a set of alternative responses whichever response style will best meet his/her needs.

The Trumpet process described above provides an essential cognitive map for students to use in learning about themselves. At the same time the Trumpet helps to insure a high degree of structure and standardization of course content and process. This standardization of Education of the Self is also facilitated through the use of the trainers' manual which describes in detail a highly structured sequence of activities used, the counseling models introduced, and several "processing" guidelines to be followed throughout the course. These guidelines were incorporated by Weinstein to "guarantee the safety of the participants both from each other and from the instructor" (Weinstein, 1976, p. 8). For example, the course does not provide for "open ended" and "free" discussion and processing, though it does provide for "air time" for each participant; the course utilizes specific procedures which formalize feedback; and peer counseling procedures are designed to
emphasize clarification rather than judgment or interpretation. Such guidelines as these which Weinstein refers to as his "consumer protection" provide a safeguard against potential abuses of roles by either trainers or participants in the course. Though the instruction of the course will vary slightly according to differences in trainers' styles, the many structures and guidelines included in Education of the Self distinguish this curriculum as a unique model of a standardized psychological education intervention.
APPENDIX B

INSTRUCTIONS AND INSTRUMENTS

1. Experience Recall Test
   A. Instructions
   B. Instrument

2. Modified Experience Recall Test
   A. Instructions
   B. Instrument

3. Pre/Post Test-Pattern
   A. Instructions
   B. Instrument

4. Pre/Post Test-Process
   A. Instructions
   B. Instrument

5. End-of-Semester Questionnaire

6. Follow-up Questionnaire

7. Background Data Questionnaire
Instructions for Administration of Experience Recall Test

The following instructions are to be read aloud to an individual or in a group setting. The numbers in brackets indicate the number of seconds the reader should wait before reading the next sentence. The written answer sheets should be handed out before the instructions are given.

Instructions

In a moment you will begin an exercise whose purpose is to help us find out how people know things about themselves. There are two parts to this exercise. First, I will have you close your eyes and help you remember an important experience in your life. Then, I'll ask you to open your eyes and answer some questions. The questions, A-F on the next two pages are the only ones we want you to answer. Read them over so you'll know what they are, and so you understand them. Your answers will be kept in strict confidence; no one except the project staff will see your responses with your birthdate on it. Are there any questions before we begin?

For the first part of this exercise, it is best if you get in a comfortable and relaxed position in your seat. Go ahead and get as comfortable as you can. Okay? Close your eyes, take a few deep breaths, and relax.

I am going to ask you to think back and remember your life and your experiences. I'll ask you to remember what you did and remember the things that happened to you. We'll start with yesterday and we'll go back as far as you can recall. As I ask you to think about different times in your life, sometimes you will remember things while other times you might not. Don't worry if you can't think of anything; just relax and wait for the next instruction. [2]
First, see if you can remember anything important about yourself yesterday [12], last month [10], last year [10], three years ago [10], when you were of high school age [10], when you were of junior high school age [10], when you were of elementary school age [10], when you were a young child [10].

I want you to find an experience or an event in your life that stands out in your mind, an experience that is somehow important to you. It might be something you will always remember, something you won't ever forget [10]. There might be several of these experiences you can think of, but pick one that you'd like to think about some more. [20]

Now, I want you to remember that experience as much as you can. First, picture the place where you were. What did it look like, and who was there. [10] Can you picture what you looked like? [10] Now, see if you can remember exactly what happened. What did you do and say? [10] What did other people do and say? [10] See if you can remember any of your thoughts, or what you were saying to yourself. [10] What were you feeling then? [10] What do you imagine other people were feeling and thinking? [10] Think a little bit about what led up to this experience. [10] And what happened as a result of this experience. [10]

Go ahead and finish the scene/event in your mind. Take your time [3] and when you are ready, at your own pace, open your eyes.

The next part is the written section. Take as much time as you need to answer all of the questions of the Experience Recall Test, A-F only. If you need more space, you may write on the backs of the pages.
Answer the questions on the answer sheet as they pertain to what you were just thinking about. You'll have twenty minutes to do this. Don't worry if you can't finish. Just answer as many as you have time for. Spelling and grammar are not important.

If you finish before the 20 minute period do not go on to the next section on the following page.
A. Describe as fully as you can, and in as much detail, the experience you remembered. (Please include what led up to this experience, what your thoughts and feelings were and what the results of this experience were.)
B. How was the experience important or special to you then?

C. How is the experience important or special to you now?

D. From the experience you just remembered, please describe some things you know about yourself now.

E. How could knowing this about yourself be useful to you? Specifically, how can it help you get what you want or avoid what you don't want?

F. Do you have any comments about what it was like answering these questions?
Instructions for Administration of Modified Experience Recall Test

The following instructions are to be read aloud to an individual or in a group setting. The numbers in brackets indicate the number of seconds the reader should wait before reading the next sentence. The written answer sheets should be handed out before the instructions are given.

Instructions

Again, in this exercise as in all of these questionnaires, your responses will be kept confidential and anonymous. Take a minute to imagine the principal groups and relationships that you are a part of. [5] These may include intimate relationships or friendships, [2] groups you are social with, [2] a group you work with, [2] a group of colleagues (students), or even your family. [2] Try to recall a recent time when you were with any of these individuals or groups and you felt uncomfortable with how you were feeling or acting. [5] Perhaps there was some type of conflict or problem and you didn't do or say what you might have wanted to in retrospect. [5] Think of such an event in which you would like to have acted or felt differently. [20] Once you have imagined this event, turn the page of your packet and begin to answer question #1 on the Modified Experience Recall Test. Be sure to wait for my signal before moving on to Question 2. You will have only a couple of minutes for each question.

Begin Question #1 [1 1/2 minutes] STOP
Begin Question #2 [2 minutes] STOP
Begin Question #3 [1 1/2 minutes] STOP
Begin Question #4 [1 1/2 minutes] STOP
Begin Question #5a and b [4 minutes] STOP
Begin Question #6 [1 1/2 minutes] STOP
Begin Question #7 [2 minutes] STOP
Begin Question #8 [2 minutes] STOP
Modified Experience Recall Test -- Direct Questions

1. What did you do in this situation?

2. What thoughts or feelings did you have in this situation?

3. Specifically, what conditions or events made you respond as you did in this situation?

4. During your experience in this situation did you want to change any of your thoughts or feelings?
   If so, what did you do to try to change them?
5.a. In what ways were your thoughts, feelings or actions in this situation typical or atypical of the thoughts, feelings or actions you have in other similar situations?

b. Describe how you usually think, feel and act in such situations—your "patterns" of behavior.

6. What do you like and/or dislike about the ways you think, feel or act in such situations?

7. Describe anything you have tried to do to modify your thoughts or feelings in order to change your patterns.

8. Do you have any ideas about ways you might try to modify any of your thoughts or feelings in order to change your patterns?
Instructions for Administration of Pre/Post-Tests--Pattern

The questionnaire entitled Pre-test Pattern Questionnaire is designed to measure the effectiveness of this course. Please turn to this questionnaire and begin reading the top half of the page labeled Introduction. Please wait for my signal before going on.

[When either 4 minutes have elapsed or most people are looking up and appear ready, begin with Section 1 directions.]

In the following 8 minutes you will be asked to list as many of your own patterns as you can in the form of pattern statements like those just illustrated. Remember, there are no right or wrong answers. You may find it difficult to identify even one pattern, or you may be able to list as many as 10. Either is acceptable. Just do the best you can.

Please begin working on Section 1 only.

[Allow 8 minutes] STOP
Pre-test Pattern Questionnaire

Introduction

A pattern is an individual's typical style of responding to situations which have something in common and thus form a class of situations.

Examples of classes of situations include:

1. speaking in front of a large group
2. visiting with friends at a party
3. conflicts with authority figures
4. competitive situations with members of the opposite sex

Examples of statements of responding styles include:

A. I feel trusting of others and very self-aware and I move deliberately and gracefully.
B. I feel angry and resentful and in a loud voice I tell them "stop."
C. I feel relaxed and at ease and become very playful and friendly.
D. I feel bored and inattentive, become preoccupied with my own thoughts and gradually withdraw.

A "pattern statement" must include descriptions of both the class of situation in which you are involved and your responding style. For example:

"When I experience conflict with an authority figure, I feel frustrated and powerless and I withdraw."

1. In the space below list as many of your own patterns as you can. Use a form like that described above for your pattern statements. The patterns you list should be drawn from several kinds of situations. Thus you can list patterns that are not related to one another.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
Instructions for Administration of Pre/Post-Tests--Process

If a pattern is a comfortable one for you, like feeling self-confident and poised in job-related interviews, you may wish to keep it. If, however, the pattern is uncomfortable or if you don't like acting as you do when using the pattern, you may wish to change it by thinking, feeling, or behaving differently.

Think about some of those patterns that are uncomfortable or perhaps that interfere with your effectiveness. [10]

Now turn to the last page of the questionnaire and answer question #2, A through D. Again you will have 8 minutes.

[Allow 8 minutes] STOP

We have now completed this series of exercises and questionnaires. We know how frustrating and tiring this process can be. Thank you very much for your help in this study.

[Collect all questionnaire packets]
2. Think about anything you have tried to do to modify your thoughts or feelings in order to change any of your patterns (either those you listed earlier or others).

A. What thoughts or feelings did you attempt to modify?

B. What did you do to modify them?

C. Were you successful?

D. If you didn't try to change any of your patterns, describe how you might modify your thoughts or feelings if you wished to change some pattern.
End-of-Semester Questionnaire

Birthdate__________________
Name of degree program_________
Instructor____________________
Graduate______ Undergraduate_____
Sex:  M______ F_______

In the questionnaire below check one response to each question pertaining to your experience of the course, Education of the Self.

1. I found the course material to be easily understandable.  Always___ Never___ Sometimes___
2. I was comfortable throughout the course.  Always___ Never___ Sometimes___
3. I found the course to be interesting.  Always___ Never___ Sometimes___
4. I found the course to be emotionally satisfying.  Always___ Never___ Sometimes___
5. I found the course to be intellectually stimulating.  Always___ Never___ Sometimes___
6. I found the course to be personally enriching.  Always___ Never___ Sometimes___

7. The course was valuable for me in many ways.  Yes___ No___ Somewhat___
8. The course was a very beneficial experience for me.  Yes___ No___ Somewhat___
9. The course was applicable to many areas of my life.  Yes___ No___ Somewhat___
As a result of my experience in this course I am now able to:

1. identify my patterns of behavior (check one) Yes____ No____ Somewhat____

2. determine the positive and negative consequences of my patterns Yes____ No____ Somewhat____

3. try out alternative behaviors if I am dissatisfied with the old pattern Yes____ No____ Somewhat____

4. evaluate and choose new behaviors Yes____ No____ Somewhat____

5. assist others in working on their patterns by facilitating the trumpet process Yes____ No____ Somewhat____
Follow-up Questionnaire

Listed below are a series of questions concerning your experience in Education of the Self. Read each question below carefully. Indicate your response to each question by checking one of the answer choices and where appropriate by providing a short answer.

1. What is your birthdate?

2. What was your overall reaction to Education of the Self?
   - Extremely Positive
   - Positive
   - Neutral
   - Somewhat Negative
   - Very Negative

   Additional Comments:

3.a. Did you find the course material easily understandable?
   - Always
   - Usually
   - Sometimes
   - Never

3.b. Were you comfortable throughout the course?
   - Always
   - Usually
   - Sometimes
   - Never

3.c. Did you find the course to be interesting?
   - Always
   - Usually
   - Sometimes
   - Never

3.d. Was the course emotionally satisfying for you?
   - Always
   - Usually
   - Sometimes
   - Never

3.e. Was the course intellectually stimulating for you?
   - Always
   - Usually
   - Sometimes
   - Never

3.f. Was the course personally enriching for you?
   - Always
   - Usually
   - Sometimes
   - Never

4. Throughout the course Education of the Self the Trumpet process was the primary tool used for working on patterns. This process included the following steps: 1. Experiencing a confrontation; 2. Making an inventory of responses; 3. Identifying patterns; 4. Determining pattern functions; 5. Assessing pattern consequences; 6. Experimenting with behavior; 7. Evaluating experiments; 8. Choosing responses.

To what extent have you been able to apply the Trumpet process to your life in working on current patterns?
   - Great Extent
   - Some Extent
   - Little Extent
   - Not at All

In what ways have you used this process?
5. To what extent have you been working on personal goals or new directions as a result of your experience in Education of the Self?

   ___ Great Extent   ___ Some Extent   ___ Little Extent   ___ Not at All

What are some of these personal goals or new directions?

6. To what extent was Education of the Self valuable in helping you choose more effective responses to uncomfortable situations?

   ___ Great Extent   ___ Some Extent   ___ Little Extent   ___ Not at All

In what other ways was the course valuable to you?
Background Data

1. Have you ever taken a course in psychological education or counseling? ______
   If yes, approximately how many courses? ______

2. Have you ever attended ongoing counseling or therapy sessions? ______
   For how long? ______ Please state approach used, if known ______

3. Have you ever participated in a "personal growth" program offered through
   the University or elsewhere (e.g. EST, T-Groups, TtL-labs, Transactional
   Analysis Groups, Support Groups, etc.)? ______ If so, please
   name: ______

4. Below are listed reasons for taking this course. Assign a 1 to the most
   important reason for your taking this course, a 2 to the second most
   important reason for your taking this course, and a 3 to the third most important
   reason for your taking this course.

   A. ______ personal improvement/self-development/personal growth
   B. ______ social (meet some interesting people)
   C. ______ needed an elective
   D. ______ little work for a good grade ("easy A")
   E. ______ intellectual curiosity/enjoyment of subject matter
   F. ______ develop skills for use in teaching
   G. ______ recommended by someone
   H. ______ help in working out a personal problem or conflict
   I. ______ learning about myself
   J. ______ Other ________
APPENDIX C

TABLE 21: SUMMARY TABLES OF REGRESSIONS USING ALL DEMOGRAPHIC MEASURES
## Table 21

Summary Tables of Regressions Using All Demographic Measures

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable Entered</th>
<th>F</th>
<th>Significance</th>
<th>Multiple R</th>
<th>R Square</th>
<th>R Square Change</th>
<th>Simple R</th>
<th>Overall F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MERT-Pattern</td>
<td>6.737</td>
<td>.019</td>
<td>.533</td>
<td>.284</td>
<td>.284</td>
<td>.533</td>
<td>6.737</td>
<td>.019</td>
</tr>
<tr>
<td>2</td>
<td>Experience</td>
<td>2.675</td>
<td>.121</td>
<td>.622</td>
<td>.386</td>
<td>.103</td>
<td>.407</td>
<td>5.038</td>
<td>.020</td>
</tr>
<tr>
<td>3</td>
<td>ERT Stage</td>
<td>.790</td>
<td>.388</td>
<td>.646</td>
<td>.417</td>
<td>.031</td>
<td>.183</td>
<td>3.578</td>
<td>.039</td>
</tr>
<tr>
<td>4</td>
<td>Sex</td>
<td>.914</td>
<td>.355</td>
<td>.673</td>
<td>.453</td>
<td>.036</td>
<td>-.249</td>
<td>2.897</td>
<td>.061</td>
</tr>
<tr>
<td>5</td>
<td>Professional Reasons</td>
<td>1.198</td>
<td>.294</td>
<td>.706</td>
<td>.499</td>
<td>.046</td>
<td>.386</td>
<td>2.590</td>
<td>.078</td>
</tr>
<tr>
<td>6</td>
<td>Age</td>
<td>1.722</td>
<td>.214</td>
<td>.750</td>
<td>.562</td>
<td>.063</td>
<td>.079</td>
<td>2.565</td>
<td>.078</td>
</tr>
<tr>
<td>7</td>
<td>MERT-Process</td>
<td>1.779</td>
<td>.209</td>
<td>.789</td>
<td>.623</td>
<td>.061</td>
<td>.167</td>
<td>2.595</td>
<td>.076</td>
</tr>
<tr>
<td>8</td>
<td>Group</td>
<td>.685</td>
<td>.427</td>
<td>.804</td>
<td>.647</td>
<td>.024</td>
<td>.252</td>
<td>2.292</td>
<td>.110</td>
</tr>
<tr>
<td>9</td>
<td>Personal Reasons</td>
<td>.632</td>
<td>.447</td>
<td>.819</td>
<td>.670</td>
<td>.023</td>
<td>-.178</td>
<td>2.032</td>
<td>.153</td>
</tr>
<tr>
<td>10</td>
<td>ERT Summary</td>
<td>.035</td>
<td>.857</td>
<td>.820</td>
<td>.671</td>
<td>.001</td>
<td>.044</td>
<td>1.636</td>
<td>.249</td>
</tr>
<tr>
<td>11</td>
<td>Lack-of-Purpose Reasons</td>
<td>.012</td>
<td>.915</td>
<td>.820</td>
<td>.672</td>
<td>.001</td>
<td>-.168</td>
<td>1.305</td>
<td>.373</td>
</tr>
<tr>
<td>Step</td>
<td>Variable Entered</td>
<td>F</td>
<td>Significance</td>
<td>Multiple R</td>
<td>R Square</td>
<td>R Square Change</td>
<td>Simple R</td>
<td>Overall F</td>
<td>Significance</td>
</tr>
<tr>
<td>------</td>
<td>---------------------------</td>
<td>-------</td>
<td>--------------</td>
<td>------------</td>
<td>----------</td>
<td>----------------</td>
<td>----------</td>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>1</td>
<td>Professional Reasons</td>
<td>5.295</td>
<td>.034</td>
<td>.487</td>
<td>.238</td>
<td>.238</td>
<td>.487</td>
<td>5.295</td>
<td>.034</td>
</tr>
<tr>
<td>2</td>
<td>Sex</td>
<td>2.963</td>
<td>.104</td>
<td>.597</td>
<td>.357</td>
<td>.119</td>
<td>-.289</td>
<td>4.435</td>
<td>.029</td>
</tr>
<tr>
<td>3</td>
<td>MERT-Process</td>
<td>2.162</td>
<td>.162</td>
<td>.662</td>
<td>.438</td>
<td>.081</td>
<td>.146</td>
<td>3.892</td>
<td>.031</td>
</tr>
<tr>
<td>4</td>
<td>Age</td>
<td>5.721</td>
<td>.031</td>
<td>.775</td>
<td>.601</td>
<td>.163</td>
<td>.136</td>
<td>5.268</td>
<td>.008</td>
</tr>
<tr>
<td>5</td>
<td>ERT Summary</td>
<td>1.509</td>
<td>.241</td>
<td>.801</td>
<td>.642</td>
<td>.042</td>
<td>.204</td>
<td>4.670</td>
<td>.012</td>
</tr>
<tr>
<td>6</td>
<td>MERT-Pattern</td>
<td>1.212</td>
<td>.292</td>
<td>.822</td>
<td>.675</td>
<td>.033</td>
<td>.471</td>
<td>4.157</td>
<td>.017</td>
</tr>
<tr>
<td>7</td>
<td>ERT Stage</td>
<td>1.182</td>
<td>.300</td>
<td>.841</td>
<td>.707</td>
<td>.032</td>
<td>.230</td>
<td>3.786</td>
<td>.024</td>
</tr>
<tr>
<td>8</td>
<td>Lack-of-Purpose Reasons</td>
<td>.049</td>
<td>.829</td>
<td>.842</td>
<td>.708</td>
<td>.001</td>
<td>-.208</td>
<td>3.033</td>
<td>.052</td>
</tr>
<tr>
<td>9</td>
<td>Group</td>
<td>.038</td>
<td>.849</td>
<td>.842</td>
<td>.709</td>
<td>.001</td>
<td>.236</td>
<td>2.441</td>
<td>.100</td>
</tr>
<tr>
<td>10</td>
<td>Experience</td>
<td>.026</td>
<td>.875</td>
<td>.843</td>
<td>.710</td>
<td>.001</td>
<td>.278</td>
<td>1.962</td>
<td>.176</td>
</tr>
</tbody>
</table>
Table 21 (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable Entered</th>
<th>F</th>
<th>Significance</th>
<th>Multiple R</th>
<th>R Square</th>
<th>R Square Change</th>
<th>Simple R</th>
<th>Overall F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Experience</td>
<td>9.136</td>
<td>.005</td>
<td>.466</td>
<td>.217</td>
<td>.217</td>
<td>.466</td>
<td>9.136</td>
<td>.005</td>
</tr>
<tr>
<td>2</td>
<td>Professional Reasons</td>
<td>3.690</td>
<td>.064</td>
<td>.546</td>
<td>.298</td>
<td>.081</td>
<td>.259</td>
<td>6.785</td>
<td>.003</td>
</tr>
<tr>
<td>3</td>
<td>Sex</td>
<td>3.371</td>
<td>.076</td>
<td>.606</td>
<td>.367</td>
<td>.069</td>
<td>-.313</td>
<td>5.983</td>
<td>.002</td>
</tr>
<tr>
<td>4</td>
<td>ERT Summary</td>
<td>.978</td>
<td>.331</td>
<td>.622</td>
<td>.387</td>
<td>.020</td>
<td>-.071</td>
<td>4.728</td>
<td>.004</td>
</tr>
<tr>
<td>5</td>
<td>Personal Reasons</td>
<td>.519</td>
<td>.477</td>
<td>.630</td>
<td>.397</td>
<td>.011</td>
<td>-.096</td>
<td>3.826</td>
<td>.009</td>
</tr>
<tr>
<td>6</td>
<td>Group</td>
<td>.843</td>
<td>.366</td>
<td>.644</td>
<td>.415</td>
<td>.018</td>
<td>.203</td>
<td>3.311</td>
<td>.014</td>
</tr>
<tr>
<td>7</td>
<td>Age</td>
<td>1.620</td>
<td>.214</td>
<td>.669</td>
<td>.448</td>
<td>.033</td>
<td>-.059</td>
<td>3.132</td>
<td>.015</td>
</tr>
<tr>
<td>8</td>
<td>MERT-Pattern</td>
<td>.664</td>
<td>.423</td>
<td>.680</td>
<td>.462</td>
<td>.014</td>
<td>.257</td>
<td>2.790</td>
<td>.023</td>
</tr>
<tr>
<td>9</td>
<td>Lack-of-Purpose Reasons</td>
<td>.435</td>
<td>.515</td>
<td>.686</td>
<td>.471</td>
<td>.009</td>
<td>-.051</td>
<td>2.474</td>
<td>.036</td>
</tr>
<tr>
<td>10</td>
<td>MERT-Process</td>
<td>.299</td>
<td>.590</td>
<td>.691</td>
<td>.478</td>
<td>.007</td>
<td>.013</td>
<td>2.194</td>
<td>.056</td>
</tr>
</tbody>
</table>
### Table 21 (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable Entered</th>
<th>F</th>
<th>Significance</th>
<th>Multiple R</th>
<th>R Square</th>
<th>R Square Change</th>
<th>Simple R</th>
<th>Overall F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MERT-Pattern</td>
<td>3.867</td>
<td>.066</td>
<td>.431</td>
<td>.185</td>
<td>.185</td>
<td>.431</td>
<td>3.867</td>
<td>.066</td>
</tr>
<tr>
<td>2</td>
<td>Age</td>
<td>1.604</td>
<td>.223</td>
<td>.509</td>
<td>.260</td>
<td>.074</td>
<td>-.084</td>
<td>2.804</td>
<td>.090</td>
</tr>
<tr>
<td>3</td>
<td>Professional Reasons</td>
<td>4.119</td>
<td>.061</td>
<td>.647</td>
<td>.419</td>
<td>.160</td>
<td>.308</td>
<td>3.607</td>
<td>.038</td>
</tr>
<tr>
<td>4</td>
<td>MERT-Process</td>
<td>5.284</td>
<td>.037</td>
<td>.760</td>
<td>.578</td>
<td>.159</td>
<td>.135</td>
<td>4.799</td>
<td>.012</td>
</tr>
<tr>
<td>5</td>
<td>Sex</td>
<td>1.231</td>
<td>.287</td>
<td>.784</td>
<td>.615</td>
<td>.036</td>
<td>-.325</td>
<td>4.149</td>
<td>.018</td>
</tr>
<tr>
<td>6</td>
<td>Personal Reasons</td>
<td>.555</td>
<td>.471</td>
<td>.795</td>
<td>.632</td>
<td>.017</td>
<td>-.079</td>
<td>3.431</td>
<td>.033</td>
</tr>
<tr>
<td>7</td>
<td>Group</td>
<td>.601</td>
<td>.454</td>
<td>.807</td>
<td>.651</td>
<td>.019</td>
<td>.104</td>
<td>2.929</td>
<td>.054</td>
</tr>
<tr>
<td>8</td>
<td>Experience</td>
<td>.063</td>
<td>.806</td>
<td>.808</td>
<td>.653</td>
<td>.002</td>
<td>.217</td>
<td>2.353</td>
<td>.103</td>
</tr>
<tr>
<td>9</td>
<td>ERT Summary</td>
<td>.043</td>
<td>.841</td>
<td>.809</td>
<td>.655</td>
<td>.002</td>
<td>.063</td>
<td>1.896</td>
<td>.177</td>
</tr>
<tr>
<td>10</td>
<td>ERT Stage</td>
<td>.024</td>
<td>.880</td>
<td>.810</td>
<td>.656</td>
<td>.001</td>
<td>.228</td>
<td>1.524</td>
<td>.281</td>
</tr>
</tbody>
</table>
Table 21 (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable Entered</th>
<th>F</th>
<th>Significance</th>
<th>Multiple R</th>
<th>R Square</th>
<th>R Square Change</th>
<th>Simple R</th>
<th>Overall F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Experience</td>
<td>10.335</td>
<td>.003</td>
<td>.483</td>
<td>.233</td>
<td>.233</td>
<td>.483</td>
<td>10.335</td>
<td>.003</td>
</tr>
<tr>
<td>2</td>
<td>MERT-Pattern</td>
<td>3.430</td>
<td>.073</td>
<td>.553</td>
<td>.305</td>
<td>.072</td>
<td>.389</td>
<td>7.252</td>
<td>.002</td>
</tr>
<tr>
<td>3</td>
<td>Age</td>
<td>2.348</td>
<td>.135</td>
<td>.594</td>
<td>.353</td>
<td>.047</td>
<td>-.189</td>
<td>5.814</td>
<td>.003</td>
</tr>
<tr>
<td>4</td>
<td>Professional Reasons</td>
<td>2.178</td>
<td>.150</td>
<td>.629</td>
<td>.395</td>
<td>.042</td>
<td>.194</td>
<td>5.066</td>
<td>.003</td>
</tr>
<tr>
<td>5</td>
<td>ERT Summary</td>
<td>.823</td>
<td>.372</td>
<td>.641</td>
<td>.411</td>
<td>.016</td>
<td>.029</td>
<td>4.194</td>
<td>.005</td>
</tr>
<tr>
<td>6</td>
<td>ERT Stage</td>
<td>.491</td>
<td>.489</td>
<td>.649</td>
<td>.421</td>
<td>.010</td>
<td>.285</td>
<td>3.518</td>
<td>.010</td>
</tr>
<tr>
<td>7</td>
<td>Group</td>
<td>.627</td>
<td>.435</td>
<td>.659</td>
<td>.434</td>
<td>.013</td>
<td>.052</td>
<td>3.066</td>
<td>.016</td>
</tr>
<tr>
<td>8</td>
<td>MERT-Process</td>
<td>.431</td>
<td>.517</td>
<td>.665</td>
<td>.442</td>
<td>.009</td>
<td>.077</td>
<td>2.682</td>
<td>.026</td>
</tr>
<tr>
<td>9</td>
<td>Sex</td>
<td>.197</td>
<td>.661</td>
<td>.669</td>
<td>.447</td>
<td>.004</td>
<td>-.227</td>
<td>2.335</td>
<td>.044</td>
</tr>
<tr>
<td>10</td>
<td>Lack-of-Purpose Reasons</td>
<td>.036</td>
<td>.852</td>
<td>.669</td>
<td>.448</td>
<td>.001</td>
<td>.116</td>
<td>2.027</td>
<td>.074</td>
</tr>
<tr>
<td>11</td>
<td>Personal Reasons</td>
<td>.070</td>
<td>.793</td>
<td>.670</td>
<td>.449</td>
<td>.002</td>
<td>-.066</td>
<td>1.781</td>
<td>.115</td>
</tr>
</tbody>
</table>