THE EFFECTS OF THREE INTERVENTIONS
ON THE CAREER DEVELOPMENT OF
HIGH SCHOOL STUDENTS

BY

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With sincere gratitude, I dedicate this study to my wife, Sandy, and to my parents, Mollie and Dave, for their love and support.
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And finally to my family, Sandy, my wife, and Whitney and Leslie, my daughters, I thank them for their love and patience; I am eagerly anticipating reassuming my role as husband and father now that this extended undertaking has been completed.
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THE EFFECTS OF THREE INTERVENTIONS ON THE CAREER DEVELOPMENT OF HIGH SCHOOL STUDENTS

By

David L. Glaize

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Chairman: Robert D. Myrick
Major Department: Counselor Education

Career development and career guidance are an important part of the curriculum at every high school. The purpose of this study was to investigate three different counselor interventions on the career development of high school students. Vocational Exploration Group (VEG), a small group vocational experience; DISCOVER, a computer-assisted guidance program; and a combination of VEG plus DISCOVER were used as the three experimental treatments.

To study the effects of these approaches, a Randomized Control-group Posttest Only design with four dependent variables and four levels of career intervention was used. Students (N=104) from five high schools in Orange County, Florida, were randomly selected and assigned to one of the three treatment groups or a control group.

The dependent variables were career maturity; career decision-making; career-goal-directed behavior; and student attitudes about self, school, and work. All data were pooled for analyses. Data analyses consisted of a multivariate analysis of variance which produced
a significant (.05) F ratio. To locate the specific variable differences, the post hoc Student Newman-Keuls test of multiple comparisons was conducted. Results indicated that all three treatments had a significant (.05 level) effect on career maturity when compared with controls. When compared on decision-making, the VEG and the DISCOVER groups scored significantly (.05 level) better than did controls, while the VEG plus DISCOVER groups approached significance (.057). No significant differences appeared on the student attitude or career-goal-directed behavior variables. When experimental groups were compared, no significant differences were found on the dependent variables of career maturity, career decision-making, career goal-directed behavior, or student attitudes.

Implications of the research are 1) VEG, DISCOVER and VEG plus DISCOVER can facilitate career development and are viable counselor interventions; 2) all treatments were effective, and school counselors might choose the one most practical and economical for their situation; and 3) additional research with different populations and variations of the treatments might further help school counselors determine the value of these approaches.
CHAPTER I
INTRODUCTION

In a relatively short fifty years, American society has progressed from a homogeneous agrarian society to a modern heterogeneous technocratic society. Values, attitudes, and lifestyles have changed drastically. With this rapid change, the science of career development has been altered by the elimination of many traditional jobs, the creation of dozens of new careers, the demands for new skills that require additional training, the necessity for greater job mobility, and often the requirements for specialization and sub-specialization.

New knowledge, increased skills, and more sophisticated techniques are required of high school counselors to facilitate career development. The traditional trait-factor approach is no longer appropriate. The commonly used model of providing career information through individual counseling is inadequate. Modern career development theory emphasizes that career decision is a dynamic life-long process involving complex human behavior. School counselors need to adapt their career guidance roles to reflect these changes.

A review of the 1970's professional literature reveals several models to assist school counselors in the delivery of career guidance; however, there is a remarkable lack of research to support their effects. Some of the most important challenges for the counseling profession of the 1980's are to examine and research the roles secondary school counselors should play in career development. Counselors need to
know which techniques are most efficient and effective, as well as which approaches produce research-supported positive outcomes.

Two methods developed in the 1970's, the computer-assisted instruction models and group counseling approaches, have been used by counselors in the delivery of career guidance (Van Hoose and Pietrofesa, 1970). Although directed toward the goal of career development, these approaches frequently can represent opposite ends on a continuum with automation at one extreme (Walz, 1970) and personalization (Patterson, 1979) at the other. Empirical evidence has not yet established the value of either of these two approaches.

Need for the Study

A need for improved career guidance in schools seems evident. While some models, approaches and techniques have been described, research has been limited. Furthermore, several research studies have demonstrated the lack of effectiveness in career counseling (Baumgardner, 1977; Campbell, 1978; Farmer, 1978; Fretz, 1981; Goldman, 1976; Harris, 1973; Noeth, Roth and Prediger, 1975; Warnath, 1975).

One needs only to examine current newspapers and magazines to see the consequences in our society of less than effective career guidance. For instance, it has been estimated that for every 1,000 college students now majoring in history, there will be one job opportunity in that field; for every 850 students in the humanities, there will be one position. Yet, there are thousands of unfilled positions in engineering, computers, and the health services. Further awareness occurs as one observes that the unemployment of young black males
approaches 40 per cent while skilled technicians are in constant demand (U.S. Department of Labor, 1982).

Watkins (1980) states, "The U. S. Freedom Model is giving people the right to make life decisions without putting an emphasis on the important counseling advising role. Most people make life decisions from a position of weakness rather than strength" (p. 31). These indicators emphasize the need for improved career guidance in meeting the social and economic needs of our society.

Bailey and Stadt (1973) help build the case for career education as the single most important goal of modern education. They suggest that comprehensive career development holds the key for public education in its efforts to overcome cries of mediocrity. The dilemma of the secondary school counselor is how to provide young people with an increased awareness of self, accurate information about careers, appropriate decision-making skills, and the motivation to succeed in our society. How can career guidance be most effectively delivered?

Research has done little to provide knowledge in these important areas. Already charged with a myriad of other duties, most school counselors find it difficult to sort out the helpful information in studies which too often use poor research designs, inadequate instruments, and inappropriate statistics (Goldman, 1976; Krumboltz, 1967). Such research often produces conflicting results. "Only a tiny portion of all the research in all the journals and monographs and books has anything meaningful to say to counselors in schools, colleges, and agencies; indeed, much of it has no discernible value for anyone"
(Goldman, 1976, p. 543). There is a need for rigorous research to help evaluate methods of career guidance.

School counselors need research to help them decide the place of computers in the developmental guidance program. Are they effective career guidance tools? In addition, group work has become an essential element of secondary guidance programs; however, further research is needed to help counselors make judgements about the value of groups. Which group techniques and methods produce the most positive student results?

Vocational Exploration Group (VEG), a small group vocational experience, and DISCOVER (not an acronym), a computer-assisted guidance (CAG) system, have been used as counselor interventions in career development programs. However, the limited research has not yet demonstrated the efficacy of either of these approaches. If well-designed research establishes the validity of computer-assisted guidance and the value of group career guidance, then counselors will be able to design more effective career development programs.

**Rationale for the Study**

A growing body of knowledge related to the use of computers and groups in career guidance is emerging. Since the beginning of their use in career guidance, computers have generated a limited amount of research; however, much criticism has been leveled at the quality of these studies (Clyde, 1979; Devine, 1977; Rayman, Bryson, and Bowlsbey, 1978). The most common charge is that the overwhelming majority have been conducted by those who have developed the computer system, allowing
serious questions about the objectivity of the results (Rayman, Bryson, and Bowlsbey, 1978).

An additional concern centers around the instruments used to assess outcomes. Many have been especially created to determine user reaction to a computer program. Generally not systematically designed, most have limited reported reliability and/or validity. Also, much of the research has examined student opinions concerning the use of the computers, while few studies have focused on student attitudes, knowledge, or skills as these relate to careers (Clyde, 1979).

A third criticism of current CAG research is that the studies have examined computer systems as an isolated element of career guidance. Few studies have evaluated computer systems as a component of a total career development program (Clyde, 1979).

A final short-coming of the research in this area is that sample sizes have been extremely small (Clyde, 1979). A review of the related literature indicates that further research is needed.

Although group career guidance programs have been used in secondary schools for a longer period of time than CAG systems, similar research criticisms are common (Gazda, 1970; Kagan, 1966; Mahler, 1969; Ohlsen, 1970; Thoreson, 1969; Yalom, Lieberman, and Miles, 1973). A primary weakness in group guidance studies is found in the lack of a specified treatment, making replication of results difficult (Gazda, 1970). Other shortcomings, similar to those found in CAG studies, are lack of standardized instruments with reported reliability and validity, lack of demonstrated training or experience of the group guidance leader, lack
of control groups, failure to define objectives and to propose testable hypotheses, as well as small sample size (Goldman, 1976; Krumboltz, 1967; Mahler, 1969; Ohlsen, 1970).

Purpose of the Study

The purpose of this study was to examine the effectiveness of a computer-assisted guidance program and a small group vocational exploration experience on the career development of high school students. More specifically, this study used an experimental design to investigate the differences between DISCOVER and VEG.

Career development consists of a number of measurable variables. Four were chosen for this study: vocational maturity; career decision-making; exploratory career-goal-directed behavior; and attitudes about self, school, and work. The following research questions received attention:

1) What effect does a computer-assisted guidance program (DISCOVER), requiring approximately ten hours of student involvement, have on senior high school students' vocational maturity; career decision-making skills; exploratory career-goal-directed behavior; and attitudes about self, school, and work?

2) What effect does a small group career exploration experience (VEG) have on senior high school students' vocational maturity; career decision-making skills; exploratory career-goal-directed behavior; and attitudes about self, school, and work?

3) What effect does a combined experience of computer-assisted guidance (DISCOVER) and a small group career experience (VEG) have on
senior high school students' vocational maturity; career decision-making skills; exploratory career-goal-directed behavior; and attitudes about self, school and work?

4) Which, if any, of these experiences, VEG, DISCOVER, or VEG plus DISCOVER is the most effective career guidance intervention?

Definition of Terms

**Attitudes**—a relatively enduring system of beliefs of an individual about a subject.

**Career decision-making**—a process by which career alternatives are evaluated, selected and committed to action by an individual.

**Career development**—the life-long continuous process of implementing one's self-concept within the context of the world-of-work and society. A series of stages, this process is influenced by one's abilities, attitudes, behavior patterns, environment, interests, and values. For this study, vocational development and occupational development will be used synonymously with career development.

**Career education**—a comprehensive developmental K-16 process which utilizes teachers, counselors and community members to assist students in making better life career decisions relating to training, education, and employment.

**Career-goal-directed behavior**—individuals' initiation of further career development activities for their own vocational growth.

**Career guidance**—a systematic program of counseling and informational activities designed to increase occupational information and self-knowledge. A primary goal is to increase self-awareness and career
development. For this study, vocational guidance and career guidance will be used interchangeably.

Career maturity—the attained point in a person's career development as compared to that of one's peers.

Computer-assisted guidance (CAG)—the use of the computer to intervene in the career development of an individual.

DISCOVER—a packaged, computer-assisted career development program, available from the DISCOVER Foundation, Inc., Westminster, Maryland.


Organization of the Study

The remainder of this study is organized into four more chapters plus appendices. A review of the related literature and an in-depth examination of the rationale are presented in Chapter II. The research methodology is discussed in Chapter III including the research design, population, sample selection, hypotheses, experimental treatments, criteria instruments, administration of potteests, and experimental procedures chronology. Chapter IV will be used to present the findings and data analyses. Chapter V is a discussion of the results.
CHAPTER II
REVIEW OF THE RELATED LITERATURE

A review of the related professional literature is discussed in this chapter. It is presented as follows: 1) need for improved career guidance, 2) difficulties in delivering school career guidance, 3) contemporary career development models, 4) outcomes of career development, 5) computers and career guidance, 6) DISCOVER, 7) groups and career guidance, 8) Vocational Exploration Group, and 9) combined VEG plus Discover treatment.

Need for Improved Career Guidance

Career development needs to be improved in most American high schools. Surveys of secondary students have indicated that current practices in career guidance are inadequate.

ACT Study

In 1973, the American College Testing Corporation surveyed over 31,000 students, grades eight through eleven, in a nationwide study of occupational awareness, career plans, and career planning knowledge and activities. This study reported a marked contrast between the expressed needs of the students and the career assistance they were receiving (Prediger, Roth, and Noeth, 1973).

Seventy-eight per cent of the eleventh graders and 73 per cent of the eighth graders indicated a desire for assistance in making career plans; however, when evaluating their involvement in exploratory occupational experiences, fewer than 4 per cent of the eleventh graders
rated themselves as highly involved, and fewer than 30 per cent considered their involvement as at least average. Furthermore, when asked questions about career planning activities, only 3 per cent responded with high involvement, while fewer than 50 per cent reported average involvement. Only 20 per cent of the eleventh graders responded that they had discussed more than once or twice their career goals, interests, and abilities with someone.

Fewer than half of the eleventh graders and approximately 15 per cent of the eighth graders were able to answer correctly three-fourths or more of the questions on an occupational knowledge questionnaire, inquiring about satisfactions, interests, values and preparation requirements related to different jobs. In knowledge of career planning, only 32 per cent of the eleventh graders answered three-fourths or more of the questions correctly.

When asked to rate the effectiveness of their discussions with a counselor concerning educational and career plans after high school, only 15 per cent of the eleventh graders rated such discussions as a "lot of help." Fifty-six per cent of the eleventh graders responded "help not provided/used" or "of little help." In response to the question of the overall help provided by their school in job planning, 49 per cent of the eleventh graders indicated "little" or "none," even though 97 per cent said their counselor was available to them (Prediger, Roth, and Noeth, 1973).
Other Studies

The Youth Development Research Program of the American Institute for Research reviewed the literature to assess career guidance, counseling, placement, and follow-up activities conducted for college- and non-college-bound youth in secondary schools. A report concluded that these services were not being provided adequately (Jones, Helliwell, and Ganschow, 1975).

In response to the Student Descriptive Questionnaire (SAT, 1978, 1980), students taking the Scholastic Aptitude Test (SAT) during the 1977-78 and 1979-80 school years indicated similar concerns in response to seven items questioning their needs for assistance in college. These samples included over 1,000,000 students or about one-third of the high school seniors nationwide. The choice of vocational/educational counseling was made as the students' primary need 60 per cent of the time in 1980 and 64 per cent in 1978. The second choice, study skills, was selected by only 21 per cent of both samples.

Results of studies conducted in Orange County, Florida, reveal statistics similar to national studies. The Department of Vocational and Career Education of the Orange County School District, Orange County, Florida, surveyed over 2,000 high school students in the spring of 1981. The results indicated that 46 per cent of the students responded that they needed more assistance in planning what they would do in their future; over 49 per cent requested more information on further training opportunities.
In 1978, nine months after graduation, the annual senior follow-up survey was conducted with graduates of Orange County's public schools. Over 40 per cent of the graduates rated their high school's career guidance services as "fair" or "poor." Furthermore, over 50 per cent responded with "fair" or "poor" responses for the assistance received in decision-making. Also, dropouts surveyed nine months after leaving school indicated a need for more effective vocational guidance. Fifty-three per cent of those respondents indicated that they had not received help in making decisions about a career; 65 per cent believed they needed more assistance in "what it's like to work"; and 65 per cent expressed a need for better preparation in making life plans.

**Difficulties in Delivering School Career Guidance**

Almost two decades ago, Wrenn (1963) discussed the concerns of the profession over the lack of emphasis on vocational counseling in the public schools. He stressed that 1) the career guidance field, along with the entire educational system, was becoming more complex, thus, requiring more knowledge and increased skills of counselors; 2) increasing demands, some unrealistic, were being made on the counselor; 3) a common misconception existed that students who planned to attend college did not require vocational counseling; and finally, 4) a subtle snobbery within the profession implied that personal counseling should have a superior status. Wrenn's recommendations for improving the delivery of vocational guidance included the accepting of the complexity and difficulty of the task, updating of counselors, and emphasizing developmental
approaches. He also cautioned counselors to prepare students to choose a vocational lifestyle with future flexibility.

Later, Hansen and Borow (1973) discussed the difficulties in providing adequate career guidance. They cited such problems as 1) limited counselor time for direct work with students; 2) narrow, outdated perceptions of career guidance by students, limiting their ability to benefit from it; 3) emphasis by counselors on a specific, final choice approach rather than the developmental and motivational aspects of planning; 4) counseling based on single-job-for-life assumptions rather than career development as a series of choices within a career; 5) over-emphasis on testing and test interpretations; 6) emphasis on job content over psycho-social and lifestyle characteristics; 7) inadequate linkages that exist between counseling and education, training, placement, job adjustment and follow-up; 8) disproportionate emphasis on short-term "crises counseling"; 9) counselors' over-emphasis on working with college-bound students at the expense of others; 10) indicated by students, counselors having little influence on career plans; and 11) limited well-designed evaluation studies that add evidence to support effective outcomes of career guidance.

Jones, Helliwell, and Ganschow (1975), in their review of the literature on career guidance, summarized the following criticisms: 1) when special funds are no longer available, promising innovative programs are often discontinued before reliable evaluations have been made; 2) the primary basis for decisions in the delivery of career guidance programs is by expert opinion, not by empirical evidence; and
efforts to improve career guidance services suffer from poor planning, despite well-intentioned efforts.

Harris-Bowlsbey (1975) stated that the two great priorities facing the counseling profession are career guidance and accountability. She claimed that the weaknesses in the profession were 1) the inadequate preparation of counselors in the theory of career development, 2) the lack of knowledge of techniques to facilitate career development, and 3) the lack of understanding and experience in group process, causing inability to use this valuable technique in career guidance.

Campbell (1978) stated that there has been an established need for comprehensive guidance programs for the last decade. He concluded from national evaluations that 1) career guidance 'has to be more than just a fragmented collection of services, 2) guidance has not been nearly so effective as it could be in meeting the needs of students, 3) technology exists in the form of models and techniques for the installation of comprehensive programs, 4) pre- and in-service training is needed to update the guidance profession in new technology and the development of comprehensive programs, and 5) a major change in administrative support for guidance is necessary in order to permit adequate resources and planning time for the installation of comprehensive programs. What, then, are some models that could provide the framework for a comprehensive program of career guidance?
Contemporary Career Development Models

Developmental Models

Over the last twenty years, a number of writers have proposed models of developmental guidance. This general approach to career guidance emphasizes that career development is a process in which the individual progresses through various stages toward career maturity. These theories emphasize appropriate intervention at an individual's unique developmental stage. In these models a broad definition of career development, including self-concept, attitudes, decision-making, planning, and life-style is usually inherent.

Super. As a developmental career guidance theorist, Super (1957) described a six-step counseling model: 1) non-directive problem exploration and self-concept portrayal; 2) directive topic setting for further exploration; 3) non-directive reflection and clarification of feelings for self-acceptance and insight; 4) for reality testing directive exploration of factual data from tests, occupational information, extracurricular experiences, and grades; 5) non-directive exploration and working through of attitudes and feelings aroused by reality testing; and 6) non-directive consideration of possible courses of action for help in decision-making (p. 306). Using alternating methods of client-centered and counselor-directed activities, Super's model works clients through their own affective domain as well as into the cognitive domain of the world-of-work.

Pritchard. In his vocational counseling model, Pritchard (1962) advocated emphasis on the processes involved in correlating self-
knowledge with occupational information. He listed four formulations needed to encourage "self-at-work" exploration within the counseling process:

1. We must seek to obtain, develop, and use occupational tools sensitive to the expanded kinds of variables, occupational as well as personal, identified as significant to vocational development, success, and satisfaction.

2. Occupational exploration generally should give precedence to the broader and longer view of progressive vocational planning over the more limited view of a one-time, final occupational choice.

3. Self-exploration and occupational exploration should become more fully correlative processes.

4. The systematic search for positive vocational suggestions should be based on the particular kinds of personal-vocational factors and relationships explicitly hypothesized as significant in the individual case and should contribute to the modification and verification of these hypotheses. (pp. 676-678)

Furthermore, Pritchard made the following recommendations: 1) counseling should not be restricted to a single standard of occupational classification; 2) the outcome of counseling should not be one career choice only; 3) personal occupational hypotheses should be encouraged for each counselee; 4) forms used should provide a working tool to stimulate exploration as well as to record the nature of the decisions or courses of action taken toward future plans.

Morrill and Forrest. In their model for career development, Morrill and Forrest (1970) presented a description of counseling practices that reflects current developmental concepts. In their assessment, they discussed four types of counseling related to career guidance:

Type 1. Counseling that aids the client with a specific decision by providing information and clarification of issues.
**Type 2.** Counseling that aids the client with a specific decision by focusing on decision-making skills rather than only on the decision at hand. These skills have application for the specific situation as well as later choice-points.

**Type 3.** Counseling that views career as a process rather than an end-point toward which all decisions lead. Thus, the focus changes from the objective of making the correct ultimate choice and once-and-for-all pronouncement of identity to the process of making a continual series of choices.

**Type 4.** Counseling that focuses on creating in individuals the ability to utilize their personal attributes to achieve self-determined objectives and to influence the nature of future choices rather than merely to adapt to external pressures. (pp. 299-300)

If seen as a continuum, the career counseling process moves from a focus on a specific decision at a given time to focus on career as a process and the individual as a potent force.

*Tuckman.* Tuckman (1974) proposed a model that correlates developmental stages to school grade. Providing a framework for the ages five to eighteen, Tuckman's model recommended educational interventions for the school grades. For each of eight identified stages, career themes with sample activities and experiences, complete with instructional media, were suggested. Table 2-1 illustrates grades 9 and 10 (the stage of maturity) and Table 2-2, grades 11 and 12 (the stage of autonomy). Tuckman's model emphasized the involvement of media specialists, teachers, counselors, and community resources in career development.

*Gross.* Developing a model from sociological research, Gross (1967) identified four kinds of preparations that should occur in career development counseling:

1. Preparation for life in an organization. In our society, most workers are employed within a large organization. Students should be prepared for working in the authority hierarchy,
### TABLE 2-1
TUCKMAN'S STAGE 7: MUTUALITY—GRADES 9-10

<table>
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<th>Major orientation toward</th>
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<th>Erikson</th>
<th>Piaget</th>
<th>Necessary for progression</th>
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<td>Being able to establish meaningful relationships with others; need for social norms and acceptance</td>
<td>Tentative (values)</td>
<td>Intimacy vs isolation (Who are we?)</td>
<td>Formal operations</td>
<td>1. Establishment of relationships</td>
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Sample units
1. Developing achievement motivation: the darts-dice exercise
2. Clarifying values: the values grid and activities lists
3. Role playing: interpersonal "bargaining"
4. Videotaping and critiquing a class
5. Work visitations: the exploration of work climate
6. Group projects: cultural work stereotypes

Source: Tuckman, 1974, p. 207
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<tr>
<th>Major orientation toward</th>
<th>Ginzberg</th>
<th>Erikson</th>
<th>Piaget</th>
<th>Necessary for progression</th>
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<td>Being able to learn and produce; need to understand and be creative</td>
<td>Tentative (exploration)</td>
<td>Generativity vs stagnation (What can I become?)</td>
<td>Formal operations</td>
<td>1. Opportunity for productivity without social restraint</td>
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<th>Self-awareness</th>
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<td>1. Development of skills and competencies</td>
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<td>1. Matching self and environment</td>
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<td>2. Discussions</td>
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<td>Sample units</td>
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<td>1. Work &quot;experience&quot;: trying jobs on for size</td>
<td>3. Simulations</td>
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<td>2. Guided search: career libraries and information systems</td>
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<td>3. Group counseling: the teacher as counselor</td>
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<td>4. Simulation: career game designed by students</td>
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<td>5. The talents-demands balance sheet for matching self and career</td>
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understanding the differences between self-security and job-security, knowing about impersonal relationships, understanding routine, coping with the lack of creativity, as well as understanding the realities of mobility and demotion.

2. Preparation for a set of role relationships. Role conflict is a significant factor among modern co-workers. When making career choices, students should be able to analyze the characteristic interpersonal interactions associated with different jobs.

3. Preparation for a level of consumption. Lifestyle is one of the self-satisfactions achieved from an individual's work. Factors such as family, values, and life goals affect the choice of lifestyles; therefore, counselors need to assist people with the understanding of the place of their work within that lifestyle.

4. Preparation for occupational career. The trends in our society suggest less certainty and more change for the future. Students will be better prepared for living in this society if they are able to define career as a succession of positions having a pattern that is, to some extent, predictable and controllable.

With the rapid change of career patterns in our society, counselors should help students understand that career change and disorder are natural and manageable, while giving them the skills to adjust within that framework.

Although different, each of the models presented has emphasized the providing of appropriate career interventions for the developmental life stages. "While most theories of career development and occupational choice are concerned to some extent with the differentiation of vocational behavior over a period of time, the distinguishing feature of developmental theories is the recognition that decision-making behavior begins to develop in childhood and continues throughout adulthood" (Bailey and Stadt, 1973, p. 87). Although these models emphasize decision-making, some models focus on teaching decision-making skills as the primary process of career counseling.
Decision-Making Models

Gelatt. Gelatt (1962) proposed that the primary responsibility of the career counselor is to assist the student in the acquisition of decision-making skills. "A decision-making frame of reference will require that we define our objectives clearly, collect data and analyze its relevance, study the possible alternatives, and evaluate the consequences" (Gelatt, 1962, p. 241). The focus is on the way individuals utilize information and their perceptions of the rewards in making the successive choices involved in career development. Gelatt's process included the following steps.

1. **Purpose or objective.** Define the purpose or objective of the decision.

2. **Collect data.** Gather the data related to the decision.

3. **Utilization of the data.** In the beginning of this step, the predictive system generates possible alternative actions as well as possible outcomes. In the second step, the value system weighs the probability and desirability of the outcomes. In the third step, the criteria involve evaluation of the previous steps with the selection of a decision.

4. **Decision.** The decision made may be terminal as an outcome of the objectives, or investigatory, one that is not final, but emphasizes the method of investigation.

Gelatt's model defined the role of the counselor as 1) clarifying the client's goal in the first stage of decision-making; 2) providing data collection strategies in the second stage; 3) explaining the decision-making model; 4) facilitating the discussion of alternatives, outcomes, and criteria, including the confrontation of inaccurate perceptions in the third stage; 5) clarifying values, also in the third stage; and finally, 6) providing the opportunity for feedback and
evaluation in the follow-up of the decision. Gelatt's model emphasized sequential decision-making as a continuous process with one decision affecting and influencing the next.

**Campbell, Walz, Miller, and Kriger.** Focusing on the utilizing of guidance techniques appropriate to the student's educational level and unique characteristics, Campbell, Walz, Miller, and Kriger (1973) proposed a model that emphasized developmental decision-making. High school level students are close to the reality of major career decisions and can benefit from the use of multiple and complex methods that assist them in exploring, clarifying, evaluating and decision-making.

1. Sound decision-making requires reliable information about various options and about chances of success in these options.

2. Follow-up studies of past students provide data for the development of experience or expectancy tables for use by, and/or with, current students.

3. These tables at best can give students only an indication of how they might perform in the same situation and, therefore, data should be presented in general, simplified terms that students understand.

4. These tables can be interpreted by both students and school staff as giving answers about how a student will perform. These tables must be used only in conjunction with other guidance activities such as basic courses in decision-making and/or individual counseling.

5. Students must realize that such tables are based on their current status, i.e., ninth-grade point average. What they do in future years will alter the nature of the alternatives and probabilities for success in various alternatives. Therefore, such information should be used as part of an ongoing guidance experience that provides help for students at a variety of choice points throughout their school experience. (p. 144)

This model included a step for identifying probabilities for success and recommended guidelines when designing training in decision-making.
Tolbert. Tolbert (1974) presented a comprehensive decision-making model that outlined the following steps.

1. **Purpose.** The counselee needs to make a decision. He has at least two options.

2. **Information.** Information about the options is identified or obtained.

3. **Possibilities.** All of the possible courses of action are identified.

4. **Results possible.** Possible consequences of each alternative are examined.

5. **Results probable.** The likelihood of each consequence is predicted.

6. **Values.** The personal desirability of each consequence is assessed.

7. **Decision.** A choice is made. It may be (a) terminal or (b) investigatory.

8. **Feedback and evaluation.**
   a. The counselee judges the suitability of his decision.
   b. The counselee evaluates the effectiveness of his help.

(p. 165)

Once students have acquired the skills of using a decision-making model, the technique can be used in all facets of development; therefore, it can become a tool to facilitate life development (Pietrofesa, Bernstein, Minor, and Stanford, 1980).

**Needs Models**

Several writers have emphasized the importance of human needs in career choice. One value of these models has been career categories that have helped career counselors organize career information.
Roe. Developing a model based on Maslow's hierarchy of needs, Roe created a series of hypotheses about the relationship between early life experiences and career choice. Parental behaviors were classified on a series of continua. Responses to parental behaviors form a career orientation that leads children toward a career as well as social interests.

Although not greatly supported by research, Roe's model has made a valuable contribution by classifying careers into these eight groups: service, business contact, organization, technology, outdoor, science, general culture, and arts and entertainment. For each of these classifications, Roe listed six levels: unskilled; semiskilled; skilled; semiprofessional and small business; professional and managerial, medium level; and professional and managerial, independent responsibility (Tolbert, 1978).

Holland. Basing his model on the concept that vocational choice is an expression of an aspect of personality, Holland offered four hypotheses:

1. In our culture, most persons can be categorized as either realistic, investigative, artistic, social, enterprising or conventional.

2. The six kinds of environments include realistic, investigative, artistic, social, enterprising and conventional.

3. People search for environments that will let them exercise their skills and abilities, express their attitudes and values, and take on agreeable problems and roles.

4. A person's behavior is determined by an interaction between his personality and the characteristics of his environment. (Tolbert, 1978, p. 191)
Holland predicted that certain job categories would attract specific personality types, which then produce an identifiable atmosphere or environment. The six environments are described in more detail:

1. **Realistic.** The Realistic type is characterized as materialistic, stable, uninsightful, conforming, practical, and persistent.

2. **Investigative.** The Investigative type is characterized as analytical, curious, intellectual, precise, rational, unpopular, and methodical.

3. **Artistic.** The Artistic type is characterized as disorderly, emotional, idealistic, impulsive, impractical, and original.

4. **Social.** The Social type is characterized as cooperative, friendly, generous, persuasive, understanding, and tactful.

5. **Enterprising.** The Enterprising type is characterized as acquisitive, energetic, domineering, optimistic, talkative, and ambitious.

6. **Conventional.** The Conventional type is characterized as conforming, inhibited, orderly, practical, efficient, and prudish. (Tolbert, 1978, p. 193)

Holland has developed the **Self-Directed Search**, a self-scoring inventory that indicates the client's three highest personality types. Reporting numerous studies supporting his theory, Holland (1966) suggested that his model of career development, as well as the **Self-Directed Search**, was a clear, concise, and simplistic approach to career development.

The current theories and models of career development are limited when evaluated against the rigorous criteria of theories in the natural sciences (Bailey and Stadt, 1973). Given the weaknesses inherent in theories of complex human behavior, however, practitioners and researchers can still use these models to formulate testable hypotheses.
and design career interventions. "The issue is not to accept the theories, but rather how to apply knowledge of the theories to the solution of classroom and guidance problems" (Bailey and Stadt, 1973, p. 93).

**Outcomes of Career Development**

As explained in the broadest of definitions, career development encompasses the entire process of implementing one's self-concept in the context of the world-of-work and society. A review of the literature reveals a number of constructs or outcomes that suggest that they measure, at least in part, career development. The following section will focus on four of those constructs.

**Career Maturity**

As the most frequent measure of career development, the concept of career maturity appears to have face validity (Herr and Cramer, 1972). Defined by Hansen and Borow (1973) as "the summary construct which embraces the developmental emphasis" (p. 183), career maturity is an indication of the level that has been reached in a person's career development.

The concept of career maturity has been a frequent criterion of the measurement of career guidance programs and career interventions. In spite of the different operational definitions and the considerable variation in indices that measure career maturity, the concept remains the most popular construct used in career guidance research.

The process of progressing through different life stages may be evaluated by assessing the vocational maturity of the individual. In
their longitudinal study of secondary students, Gribbons and Lohnes (1969) classified adolescents as exhibiting constant maturity, emerging maturity, or degeneration of constant maturity.

After studying ninth grade boys, Super (1960) concluded that planning orientation was the primary factor in measuring that population's career maturity. Later, Super and associates developed the Career Development Inventory which was intended to assess cognitive and attitudinal aspects of vocational maturity. From his Career Pattern Study, Super concluded that career maturity appears to be indicated by factors in the areas of 1) knowledge of self and world-of-work; 2) attitudes toward career goals; 3) decision-making skills; and 4) realism and activity (Herr and Cramer, 1972).

In a longitudinal study, Gribbons and Lohnes (1969) identified eight dimensions of career maturity in secondary students: factors in curriculum choice, factors in occupational choice, ability to describe strengths and weaknesses, accuracy of self-appraisal, adequacy of data used for self ratings, awareness of interests, awareness of values and independence of choice. The "readiness of vocational planning," developed from these variables, has been demonstrated to contribute to predictions of occupational paths.

Crites (1974b) has identified four factors in his model of vocational maturity: vocational choice, realism of vocational choice, competencies for vocational choice, and attitudes of vocational choice. The Career Maturity Inventory (CMI) developed by Crites, which measures
competencies and attitudes related to vocational maturity, has been used to measure career maturity in over two hundred studies (Devine, 1977).

CMI-Attitude Scale. Even though two scales may be used independently, only the CMI-Attitude Scale shall be discussed in this section. Designed to measure the feelings and subjective reactions of an individual toward the world-of-work, the CMI-Attitude Scale consists of the following dimensions: involvement in the choice process, orientation toward work, independence in decision-making, preference for career choice factors, and conceptions of the choice process.

Consisting of fifty true/false questions, the Attitude Scale has one raw score. The principal usefulness of the scale, according to Crites, is "in screening individuals for counseling and in evaluating the outcomes of career education and other didactic programs and interventive experiences" (1973c, p. 11). A number of studies have used the CMI-Attitude Scale to measure career development (Adams, 1974; Bartman, 1975; Chapin, 1975; Cross, 1976; Devine, 1977; Flake, Roach, and Stenning, 1975; Hansen and Ansell, 1973; Miller, 1974; Putnam and Hansen, 1972; Smith and Herr, 1972; Tseng and Rhodes, 1973).

While several projects have examined career maturity, further research is needed (Crites, 1971; Westbrook and Mastie, 1973). Crites has listed four kinds of needed research related to career maturity: 1) survey research to strengthen definitions, 2) theoretical research to test hypotheses, 3) techniques research to improve measurement, and 4)
implied research to enhance facilitation. Career maturity remains the most comprehensive measurement of career development.

**Decision-Making**

Decision-making is a complex process by which alternatives are evaluated, selected, and committed to action by an individual (Bowlsbey, 1978). Since all career development theories incorporate the concept of decision-making, it is considered a central construct of career development (Bowlsbey, 1978; Tolbert, 1978).

Decision theory, a derivation of economic theory and psychological studies, has focused on decision-making as the primary skill required to achieve vocational maturity. Previous experiences influence vocational development; therefore, career decision-making is seen as a culmination of a continuous series of choices as a person progresses toward maturity. If individuals have an understanding of their interests, abilities, aptitudes and attitudes as well as possessing information on the world-of-work, a crystallization of career goals, planning, and choice appears to take place (Pietrofesa et al., 1980).

Tolbert (1978) compared decision theory to the trait-factor approach "because it incorporates a systematic decision-making process that provides a framework for the counselor's work" (p. 144). To teach decision-making skills based on a decision model, counselors demonstrate a strategy that is designed to help counselees solve problems, prepare to meet needs and learn a process that will assist them in future situations (Tolbert, 1978).
Adaptable to all delivery systems and based on developmental concepts, decision-making skills can be applied to complex personal, career and educational decisions. Yet, in spite of the emphasis and widespread acceptance of decision-making as a construct of career development, its measurement has been difficult (Oliver, 1978).

**Career Decision Scale (CDS).** As a measure of career decision-making, the Career Decision Scale, developed in 1976, has demonstrated usefulness. The instrument has as its rationale the assumption that difficulty in making decisions related to career choice can be attributed to a definite number of discrete circumstances (Osipow, 1980). In an effort to identify these barriers, the authors of the Career Decision Scale (CDS) have constructed sixteen items that measure obstacles that have been demonstrated to handicap career decisions. In addition, two additional scale items identify the relative certainty of career and college plans. A final item is unscorable and gives the respondent the opportunity to clarify previous responses if desired. A factor analysis of the nineteen items of the CDS has identified four factors: 1) choice anxiety leading to vocational indecision, 2) external barrier to a preferred choice, 3) approach-approach problem, and 4) personal conflict.

Since its publication, a number of studies have been conducted using the CDS. Generally, a high percentage of these studies that investigated the relationship of the CDS to other measures of career development have received significant results (Carney, 1977; Cellini, 1979; Lange, 1980; Niece and Bradley, 1979; Osipow and Schweikert, 1979;
Rogers, 1981; Slaney, 1980; Sutera, 1977; Taylor, 1979; Westbrook, 1980; Westbrook, Cutts, and Simonson, 1980; Westbrook, Simonson, and Arcia, 1978). In addition, several studies have used the CDS to evaluate the effects of career counseling interventions (Cranston, 1978; Jones, 1979; Osipow, Carney, and Barak, 1976).

As one of the most widely used outcomes related to career development, career decision-making appears to be a most important construct in the measurement of career development. Considering the difficulties inherent in career development measurement, the CDS appears to be a satisfactory instrument.

Attitudes about Self, School, and Work

Tuckman (1973) built a case for the consideration of attitudes and their role in career development. His position was that too great an emphasis has been placed on the cognitive domain in career development and too little on the affective variables of values, attitudes, motives, and feelings.

Developmental models depict career development as the implementation of self-concept, the expression of personality; "vocational choice is ultimately a result of an array of decision, major and minor, leading to self-objectification" (Holland, 1966, p. 52). Super (1957) has suggested that occupations are not only a job, but also a way of life.

Field, Kehas, and Tiedeman (1963) have suggested that career decisions are based on current attitudes of one's self: 1) what one is like, 2) what one can be like, 3) what one wants to be like, 4) what
one's situation is like, 5) what one's situation might become, and 6) the way one sees these aspects of self and situation as being related (Herr, 1970, p. 25). As presented in developmental theory, attitudes about self are seen as an integral part of career development; furthermore, attitudes about self are reflected in attitudes about school and work. Katzell (1964) conceived of career development as matching to one's self an occupation in terms of interests, attitudes, and aptitudes.

A number of research studies have validated these hypotheses. O'Hara (1966) has demonstrated the high relationship between self-concept and occupations as well as school adjustment. Williams and Cole (1968) reported that measures of self-concept were significantly related to the child's conception of school, social status at school, emotional adjustment, mutual ability, reading achievement and mathematical achievement. Similar conclusions have been made by other researchers (Brookover, Thomas, and Patterson, 1964; Campbell, 1966; Fink, 1962; Roth and Puri, 1967; Sears, 1970).

Studies have consistently demonstrated the relationship among attitudes of self, school, and careers. Low self-esteem persons are likely to choose occupations below their personality, ability, and interest (Greenhaus, 1971). High self-esteem individuals perceive themselves as competent, need-satisfying decision-makers, who choose careers appropriate to their self-concept (Barrett and Tinsley, 1977; Korman, 1967). High esteem individuals are more certain about their career choice and are more satisfied with college majors and jobs (Gray,
Tuckman (1973) proposed a model for career guidance emphasizing that affective activities should precede information-giving activities for the most effective facilitation of career development. This approach will be investigated in the current study. For this research, attitudes about self, school, and work will be measured by an instrument created for this study. Presenting validity and reliability, this instrument will be a fifteen item Likert-type scale to assess effect on the subjects.

**Career Goal-Directed Behavior**

A construct that has been used repeatedly in the research on career development is career-goal-directed or career-goal-seeking behavior. An assumption made in studies using this measure is that individuals who seek further assistance in vocational planning are demonstrating increased career development.

Used in a number of studies, particularly in behavioral counseling research, career-goal-seeking behaviors have been defined as activities such as 1) making appointments with a career counselor, 2) reading or gathering printed materials about careers, 3) visiting the career resource center, or 4) discussing career plans with others. Research studies that have used career-goal-seeking have demonstrated its relationship to career development (Aiken and Johnston, 1973; Krumboltz and Schroeder, 1965; Krumboltz and Thoresen, 1964; Limburg, 1980;

Computers and Career Guidance

As an outgrowth of the systems approach to management which is widely used in the military and in the defense industry, computers have been adapted to many educational disciplines. Based upon the developmental and decision-making models that have evolved over the last fifteen years, an increasing number of guidance and counseling professionals have become committed to the use of computers to assist counselors in the delivery of career guidance to students.

The Use of Computers

The high school student/counselor ratios, the challenge of organizing and delivering the rapidly growing amount of information available in the field of career guidance, and poorly defined counselor roles have all contributed to the counselor's inability to meet the career guidance needs of secondary students (Bowlsbey and Rayman, 1980). As primary concerns for the delivery of career guidance for the counseling profession, Norris (1976) cites 1) exponential increase in information, 2) exponential increase in dissemination requirements, and 3) accelerated curve of change.

The computer, with its capabilities for 1) storing, retrieving, updating, and searching through massive data files of occupational and educational alternatives; 2) relating student data to data about educational and occupational alternatives; 3) simulating interaction with the student; and 4) serving many users at one time while providing
individual attention to each (Bowlsbey, 1978), has the potential for meeting the needs of students and counselors. The computer releases the counselor to perform other counseling activities in the developmental guidance program.

During the late 1960's and early 1970's, much of the financial support for the delivery of career guidance was provided by the Federal government. The Educational Amendments of 1968, the Career Education Demonstration Act of 1974, the Career Education Incentives Act of 1977, and the Youth Employment and Demonstrations Projects Act of 1977 provided millions of dollars of support to promising career education programs (Clyde, 1979). The passage of the Educational Amendments of 1976 required the state governments to be responsible for providing educational information, guidance, counseling, and referral services to all state residents, including those in rural areas.

Many states envisioned computer technology as potentially the most effective method of meeting the government mandate. The Federal funding allowed state governments to purchase and develop computer systems. A more detailed discussion of the influence of state and Federal governments is beyond the scope of this paper; however, Clyde (1979) provides a thorough overview.

The Development of Computerized Career Guidance

A potent force behind the computer movement was the recognition of the need for a better system of delivering the great amount of career information to support effective career guidance programs. With their capacity to store, organize, update, and retrieve large quantities of
information for immediate and easy access, computers seemed the logical choice as the primary delivery system of career information (Harris, 1973).

Early conceptualizations envisioned the computer as an extension of Parson's trait-factor approach in which the computer could store massive details on each job. These factors would then be matched with traits obtained from the counselee (Super, 1970). As career development theories had suggested, such simplistic treatment of a complex process proved ineffective. Since that time, computer systems in career guidance have developed toward more comprehensive assistance to the client. They have been designed to provide guidance functions as well as information.

Throughout the mid-1960's, a series of consortia was conducted to design and examine projects aimed at using computers in delivering career guidance. Five of the modern computer-assisted guidance programs, 1) Educational and Career Exploration System (ECES), 2) Computerized Vocational Information System (CVIS), 3) System of Interactive Guidance and Information (SIGI), 4) Information System for Vocational Decisions (ISVD), and 5) Computer-Assisted Career Exploration (CACE), were developed from these conferences. Since that time, 1) Guidance Information System (GIS), 2) DISCOVER (not an acronym), 3) Computerized Hueristic Occupational Information and Career Exploration System (CHOICES), and 4) Coordinated Occupational Information Network (COIN) have been developed. As their primary method for meeting the
Educational Amendments Act of 1976, many states have adopted one of the above systems (Katz and Shatkin, 1980).

The current goals of most computer-assisted guidance (CAG) systems might best be expressed by Harris-Bowlsbey's (1975) concepts concerning the necessary components of a comprehensive career guidance program: 1) self-concept clarification, including clarification of interests, values and abilities; 2) translation of self-concept to occupational terms; 3) broad exploration of occupations; 4) learning decision-making skills; 5) reality testing of tentative choices; 6) making choices; and 7) implementing choices. The most advanced systems try to provide activities for each of those components.

Classification of Systems

The development of computer systems has remained in a constant state of updating, changing and revising in an attempt to become more accurate and comprehensive support systems (Clyde, 1979). Morgan (1978) suggested that the thirty systems developed to date may be divided into three categories of development.

The first may be called "batch-processing systems" or "indirect-inquiry systems." In these systems, there is no direct contact between computer and user. The user completes a questionnaire naming the characteristics desired in an occupation, college, or financial aid. This information is then sent to the computer for processing. The computer reads the characteristics of the user, searches a data file of options, selects and prints out the combination that best matches the
user. Apparently due to lack of response from counselors, this most primitive form of CAG system has only CVIS as a survivor (Harris-Bowlsbey, 1979).

With the advent of more sophisticated hardware, the second category of computer-based systems emerged, the "on-line" or "direct-inquiry systems." In addition to the rapid retrieval of large amounts of data, these systems provide the capability of making sophisticated file searches as well as allowing control of the addition and deletion of personal and occupational characteristics. While in direct communication with the computer, users are given the opportunity to explore options broadly, recycle through search strategies using different characteristics, and receive different options based on different characteristics.

As the most sophisticated category of systems, "on-line career guidance" captures the capabilities developed in the two previous systems while providing the user with better understanding of the process of career development. Adding content and functions that have formerly been accomplished by traditional delivery, these systems provide values clarification, teach decision-making skills, assist in the understanding of the role of interests and values in career decisions, compare occupations, examine and select occupations, and assist with making career/life plans. These systems emphasize teaching the decision-making process which may be used in subsequent career decisions (Clyde, 1979). A final development is that these CAG systems have the capability of storing information for the individual users; allowing for
the personalizing of the process, such as calling the user by name; reviewing one's last use of the system; and confronting the user with inconsistencies in the decision-making process.

**Current Status of CAG Systems**

Bowlsbey (1978) stated that computer-assisted guidance systems have not been as widely or rapidly accepted as the early developers had imagined. Of the approximately fifteen batch-processing systems developed in the earliest stages of computer-assisted guidance, only one remains today. Unable to establish adequate user appeal to offset their commercial price, the systems have become economically infeasible. In addition, the direct-inquiry systems were developed largely at the expense of federal, state, or private foundation funding. When this funding was removed, local school systems were unable or unwilling to provide for further development and updating of the systems. Bowlsbey (1978) cited cost and lack of use as the primary reasons for the extinction of systems.

Although they have not reached their potential, computer-based systems are currently being used in approximately five hundred sites throughout the nation. The development and expansion of new systems is minimal. Nevertheless, the Department of Labor has provided funding for nine states to provide additional vocational information services. The current practice is to update, to localize data files, and to improve systems currently in use (Bowlsbey, 1978).

Bowlsbey (1978) cites the following common characteristics of successful CAG programs:
1) They perform fairly simple data retrieval and searching tasks.

2) They combine some administrative functions (scheduling, student record keeping, attendance-keeping) with the guidance functions.

3) They make use of standard terminals that also are used for business purposes. (p. 200)

A number of trends and issues in computer-assisted guidance can be summarized:

1) Computers have not yet been integrated into the overall school guidance programs. Due to either lack of understanding or threat to counselor jobs, computers have been used as an extra to the career development program rather than as an integral part of the developmental guidance program (Bowlsbey, 1978; Clyde, 1979).

2) Each system is responsible for its own data files, and the continued task of updating is monumental (Clyde, 1979).

3) A continuing struggle has occurred between the programs and technology. Computers are often overloaded, unavailable, or in need of technical maintenance or new development. Such technical unreliability and the lack of training to counselors to enable them to cope when technical problems arise have been responsible for limited confidence among counselors and poor motivation from students (Bowlsbey, 1978).

4) Further research and evaluation of systems is imperative (Bowlsbey, 1978; Clyde, 1979). Although all systems have been evaluated using short term studies, longitudinal studies are
needed. Using instruments such as observations, questionnaires, and interviews that have questionable reliability and validity as evaluation measures, studies have been the target of much criticism. Suggesting the possibility of bias in the results, Clyde (1979) stated that much of the evaluation research on systems has been conducted by those who have developed the system.

5) Computer systems generally have been developed by a small team of research-and-development-oriented educators. Upon completion of the systems, a need may exist for a larger organization (such as IBM) to control the professional tasks of marketing, in-service training, technical assistance, consultation, installation, and maintenance of data files (Bowlsbey, 1978).

6) An atmosphere of competition exists among the various systems in operation. With public funding no longer available, cooperative efforts among systems are needed (Bowlsbey, 1978).

7) At the secondary level, successful CAG systems cost $2 to $4 per hour of operation; yet, counselor assistance is approximately $13 per hour (Bowlsbey, 1978; Clyde, 1979).

In 1970, Myers summarized the issues at that time. Although his comments were made over a decade ago, they seem to have relevance for today. The value of CAG systems lies in their ability to 1) extend the influence of the counselor by providing individual client access to
data, 2) stimulate and supplant the counselor in fostering decision-making, and 3) demonstrate the efficacy of certain ways of restructuring schools.

Super (1970) also discussed four possible appropriate sources of counselor resistance to the new technology: 1) the counselor's non-mathematical orientation in juxtaposition to the computer's complexity, 2) the computer's accuracy in contrast to the counselor's fallibility, 3) the computer's possible ability to diminish the counselor's autonomy in scheduling his own time, and 4) the computer's deterministic character that might eliminate the free-will of the user (pp. 102-105).

CAG Systems and their Evaluation

Super (1970) proposed a model for conceptualizing the goals of CAG programs. At one extreme of a continuum is the computer model's emphasis on the retrieval of information; at the other extreme is the system's emphasis on guidance and counseling functions. Clyde (1979) has placed the seven most used systems on this continuum. (See Figure 1.)

The emphasis of systems at the retrieval end is on information access; furthermore, a trait-factor link exists between interests and occupations. On the other hand, the guidance and counseling models stress primarily the teaching of decision-making and the valuing process. The advantages of the guidance models are their potential for relieving counselors of significant work, the personalized structure of their interaction with user, and their capacity for storing personal data (Clyde, 1979).
Information Retrieval Model

Guidance/Counseling Model

---

Figure 1

RELATIVE PLACEMENT OF LEADING COMPUTERIZED SYSTEMS ON AN INFORMATION-GUIDANCE CONTINUUM (Clyde, 1979)

Of the seven systems in extensive use nationally, Katz and Shatkin (1980) stated that, "Aided by infusions of federal funding, diminishing hardware costs, and demonstrations of feasibility and success, they appear to have emerged from the experimental stage, and the surviving systems have begun to make a substantial showing on the national scene" (p. 4). Due to the difference in needs, facilities, and goals of various users, the evaluation of these systems is highly subjective. Methods for determining judgements are discussed in the following paragraphs.

Katz and Shatkin (1980) stated the role of guidance in career decision-making is "to reduce the discrepancy between a (person's) untutored readiness for rational behavior and some hypothetical ideal
state of knowledge and wisdom. To fulfill this role, career guidance procedures typically (from Parsons, 1909, to the present) include three major topics, 1) appraisal of the user, 2) information about options, and 3) strategies for decision-making" (p. 5). In addition, Katz and Shatkin (1980) add the dimension of "planning" as a final activity needed to evaluate guidance. The presence and use of these guidance functions provide a framework for comparing computer-assisted guidance systems.

In order to evaluate CAG systems, Katz and Shatkin (1980) examine

1) The Scope - Which of the above components does the system deal with and to what extent?

2) The Content - What are the nature and range of the information in each of the four components?

3) The Structure - How is the user moved from one component to the next through the system?

4) The Style - What hardware is used, and what are the methods of communicating with the user? In addition, how much interaction occurs between the client and the terminal?

5) The Procedures - How do the developers make decisions such as the updating, collecting, and interpreting of data; the including of what data; and the pricing and marketing strategies?

6) The Model of Career Decision-Making - How sound is the underlying rationale of the system, and does any coherent theory undergird the system?

7) The Effectiveness - What results have evaluation studies demonstrated?

8) The Cost - What is the cost to install and operate the system? (pp. 1-3)

Harris-Bowlsbey (1979) suggested the following variables for the comparison of CAG systems:
1) The **Intent** - Is the system goal to provide information or to provide developmental career guidance?

2) The **Hardware** - Can the system be used on existing hardware, or which hardware will need to be purchased?

3) The **Content** - What depth of content is available in the CAG system: How many occupations are available; and are there data files on graduate schools, military opportunities, local jobs, financial aid, and trade/technical schools?

4) The **Target Population** - Whom was the system designed to assist (junior high, high school, junior college, or college students)? (pp. 1-4)

As the system chosen for the present study, DISCOVER will be reviewed in detail.

**DISCOVER**

Considered the most comprehensive computer-assisted career guidance program (Clyde, 1979), DISCOVER was developed from 1972 to 1976 under the direction of Jo Ann Harris-Bowlsbey, sponsored by the United States Office of Education, the IBM Corporation, and the Illinois Division of Vocational and Technical Education.

The developers of this system believe that DISCOVER represents two significant advances in career guidance: 1) it reflects what they believe to be the best of current career development theory and research; 2) it incorporates some of the best data files, tools, and professional work currently available in the field (Bowlsbey and Rayman, 1980). As an integrated group of computer programs, DISCOVER has two primary purposes: 1) to provide systematic assistance to students for the making of educational and vocational plans, and 2) to provide direct
access for counselors to large data files of educational and vocational
information as well as to monitor the progress of students who use it
(Bowlsbey and Rayman, 1980).

Designed to assist students in grades seven through twelve, DISC
COVER consists of twenty-one modules of content which are described in
detail in Appendix D. Developed from Holland's career model, DISCOVER's
modules are 1) entry, 2) understanding values, 3) playing the Values
Game, 4) learning to make decisions, 5) practicing career decisions, 6)
learning how occupations can be grouped, 7) browsing occupations, 8)
reviewing my interests and strengths, 9) making a list of occupations to
explore, 10) getting information about occupations, 11) narrowing my
list of occupations, and 12) exploring specific career plans. The
number 12 module, exploring career plans, is further divided into nine
submodules: 1) local jobs, 2) financial aid, 3) apprenticeships, 4)
four-year college information and search, 5) community and junior
colleges, 6) graduate and professional schools, 7) technical and
specialized schools, 8) continuing education, and 9) military
information.

The DISCOVER system is software that may be stored in a large
central computer. This software then is available to users through
television screen-like terminals called Cathode Ray Tubes (CRTs) which
are connected to the central computer by cables. The user communicates
to the computer by either typing responses on the CRT or touching an
electronic light pen to designated spaces on the screen. User responses
are then transmitted over the cables to the central computer and, based
upon its preprogrammed routines, the computer responds. In order to
make responses, the computer will recall and use data which are stored in files containing pre-planned script or dialogue; information about the user; and information about occupations, schools, or training programs. In addition, DISCOVER provides the capability for development of local modules and information (Bowlsbey and Rayman, 1980).

One advantage of DISCOVER is the inclusion of methods and techniques for the integration of the computer system into the developmental comprehensive guidance program. In the professional manual, specific counselor strategies, activities, and interventions are recommended; however, Bowlsbey and Rayman (1980) stated that one of three feasible uses of DISCOVER is to provide the computer system without other interventions by a counselor. As a comprehensive computer-assisted guidance system, DISCOVER enables a student to progress through a complete process of career development.

Effectiveness of DISCOVER

As the newest of the seven CAG systems currently being widely used nationwide, only two studies investigating DISCOVER are currently reported. The first, conducted by Rayman, Bryson, and Bowlsbey (1978), involved ninety-six students in grades seven through twelve.

The results indicated students and parents highly favored the use of DISCOVER by students. Students felt DISCOVER assisted them in values clarification, decision-making, and learning about occupations. Their only major dissatisfaction was technical hardware problems that either slowed computer response time or made the computer unavailable for student use.
On two standardized measures, the Career Development Inventory and Assessment of Career Development, significant differences were not obtained between computer-assisted students and controls. These results might be explained by the small sample size, the technical problems with the new system, and the inappropriate use of these instruments.

Involving 245 secondary students, the second study conducted by Savin (1979) investigated student opinions concerning the use of DISCOVER. A high percentage of students liked DISCOVER (73%), found it helpful (56%), and would recommend it to a friend (91%); however, no standardized measures were used to obtain student growth in career development.

Although the results of these two studies indicate some success in the use of DISCOVER as a career intervention, a need exists for further research to evaluate the outcomes of this newest CAG system. Although its sound theoretical base, the expertise of its developers, and the breadth of its scope demonstrate potential, only further outcome research can establish the required correlation between DISCOVER and career development.

Effectiveness of CAG

A number of studies have been conducted to evaluate the outcomes of computer-assisted guidance. The results can be grouped into four categories: user reactions, parent reactions, standardized measures, and comparison with counselor functions (Bowlsbey, 1978).

User Reactions. All systems reported favorable user reaction to their programs (Clyde, 1979). A large majority of students liked to use

In addition, students have reported a number of positive effects: 1) increased vocational exploratory behavior including reading, sending for materials, and talking to people; 2) increased crystallization of career plans; 3) preference for receiving information by computer rather than by traditional methods; 4) acquired information about careers and education; 5) increased knowledge of specific occupations; 6) increased broad occupational knowledge; and 7) increased knowledge of self, such as understanding interests, values and aptitudes (Chapman et al., 1973; Frederickson, 1978; Harris, 1973; Harris-Bowlsbey et al., 1976; Impellitteri, 1968; McKinley and Adams, 1971; Risser and Tulley, 1977; Ryan, Drummond, and Shannon, 1980; Weick, 1972; Willingham, 1978; Wolff, 1976).

**Parent Reactions.** Three studies have examined parent response to the participation of their adolescents in CAG programs. Results have indicated parent awareness of the need for improved career guidance as well as increased family discussion and participation in career planning (Harris-Bowlsbey et al., 1976; Myers, Lindeman, Forrest and Super, 1971; Rayman, Bryson, and Bowlsbey, 1978).

**Standardized Measures of Career Development.** Standardized instruments frequently have been used to measure the effectiveness of computer guidance programs. Having studied the effects of CAG systems
on the career maturity of students, a number of researchers have obtained conflicting results. Devine (1977) found no significant difference in vocational maturity between students using SIGI as a treatment and a control group; however, Pyle and Stripling (1976), using the same system combined with individual counseling, found a significant increase in vocational maturity. The critical issue might be that Pyle and Stripling used counselor intervention in their treatment, while Devine did not. Melhus (1971) and Myers, Thompson, Lindeman, Super, Patrick, and Friel (1972) found similar results. Such evidence lends support to Clyde's (1979) position that CAG systems are most effective when used in combination with other career development interventions.

Rayman et al. (1978) obtained no significant differences between CAG users and control groups on vocational maturity. However, other researchers have reported significant increases in career maturity using CAG systems (Cassie, 1979; Drake, 1979; English, 1974; Harris, 1973; Metze, 1980; Myers, Lindeman, Thompson, and Patrick, 1975; Myers et al., 1972).

Sampson and Stripling (1979) analyzed the effects of three career interventions: structured group counseling, nonstructured group counseling, and a control group. Each treatment was then paired with a CAG system. Significant increases were measured in the first and third groups. All students preferred to consult with a counselor while using a CAG system.

On the variable of career decision-making, Bohn et al. (1970) obtained significant differences, but not on the variables of
educational planning, work values, or vocational preference. Cochran, Hoffman, Strand, and Warren (1976) also obtained significant increases on a vocational decision-making scale.

Harris (1973), Maola (1975), and Jones (1977) found statistically significant differences in occupational knowledge using CAG as a treatment. Lindeman, Forrest, Myers and Bohn (1972) obtained significant differences between urban students and controls on occupational knowledge. They found inner city students gained in occupational knowledge; however, they found no significant differences with students from other demographic locations.

Comparison with Counselor Functions. Melhus, Hershenson and Vermillion (1973) compared individual counseling to CAG for upper quartile and lower quartile students on the variable of vocational planning. His conclusions were that the lower quartile students responded better to individual counseling, while upper quartile students responded equally well to either intervention.

In comparing CAG systems to individual counseling for assistance in selection of high school courses, Price (1974) and Price and Johnson (1973) found no differences on four different measures. Their conclusion was that CAG systems may be equally as effective as individual counseling. In related studies, Myers et al. (1972) and Messena (1977) measured the effects of a combined computer-counselor treatment and found significant differences on career planning behaviors and skills with this systematic treatment.
From the literature review, it might be concluded that 1) computer-assisted guidance systems enhance the retention of occupational information, 2) CAG systems effect changes in career certainty, 3) students react favorably to computer systems, and 4) evidence exists that combining a CAG intervention with a more personalized counselor intervention might be the most effective career development delivery approach.

Research findings on standardized measures of career development are more inconclusive. Studies have not consistently established the effects of CAG on career maturity, decision-making, job knowledge, work attitudes, work values or other measures of career development. The need exists for sound research to further evaluate CAG systems.

Clyde (1979) summarized the weaknesses in the current CAG system research to be 1) that inadequate, nonstandardized instruments lacking validity and reliability are commonly used; 2) that evaluations of CAG systems by professionals not involved in the development of the program are needed; and 3) that the responses of counselors to CAG systems have not been studied.

A growing body of knowledge related to computer-assisted guidance has been produced. However, further research is needed to help define the role of the computer in career development.

**Groups and Career Guidance**

Ramirez (1977) stated that, in addition to their needs for acquiring career information, students need assistance in how to utilize that information. Developmental theories emphasize that career decision is
more complex than disseminating information. Career guidance should assist students with the processing of that information.

Group counseling has been advocated as one of the most efficient and effective methods for facilitating career decisions. Some advantages cited for the use of group career guidance include 1) more efficient use of staff, 2) benefits of social modeling, 3) sharing of common concerns, 4) reality testing in a social context, and 5) providing a microcosm of the larger society (Hoffman and Cochran, 1974). Mathewson (1970) described the group setting as a "psychological gymnasium for the exercise of individual perceptions—their clarification, situational connections, integration and ultimate value orientations" (p. 139).

Advocates of group counseling have believed that goal-directed social interaction as well as group support are necessary conditions to facilitate maximal personal and career development growth. These conditions are available through planned, small group experiences.

Outcome Research on Group Counseling

As a result of research, the general effectiveness of vocational group counseling has been established (Tolbert, 1978). In the following section, the literature related to vocational group counseling will be discussed.

Group Counseling Research Without Significant Results. Using "group counseling" as an unspecified treatment, Das (1963), Nichol (1970), and Williams (1967) found no significant differences between
experimental and control groups on the variable of vocational maturity as measured by the Career Maturity Inventory.

Hanley (1970) and Launer (1966), using group treatments that were only briefly described, found no significant differences between experimental and control groups. Launer measured vocational values after treatment while Hanley, using a pretest-posttest design, examined career maturity, self-concept, and grade point average.

Group Counseling Research With Significant Results. In comparing three different treatments, programmed self-instruction, individual intervention, and group counseling, Graff, Danish, and Austin (1972) discovered that all produced significant results in career maturity; however, they concluded that programmed self-instruction was the most effective.

Westbrook (1973) found significant differences in groups when three treatments were compared: 1) occupational information, 2) test information plus occupational information, and 3) test interpretation only. The groups receiving occupational information and test information plus occupational information demonstrated greater career maturity than those receiving test interpretation only.

Schenk (1979) discovered significant results between experimental and control groups on career maturity in groups participating in vocational group counseling as measured by Super's Career Development Inventory. In a similar study, Hansen (1976) concluded that a group vocational activity improved the vocational maturity and self-concept of secondary school students.
Perovich (1980) compared the effectiveness of two treatments: 1) a vocational information group (VIG), 2) a self-growth group (SGG), and 3) a control group (CG), finding the VIG group significantly higher than the CG on both vocational maturity and self-esteem. The SGG was significantly higher than the VIG on vocational maturity. In a similar study, Borgen (1978) used a small vocational exploration group with under-achieving high school students, concluding that it was effective in improving school achievement and career maturity.

Using high school students, Gilliland (1966) conducted a flexible group counseling experience which extended over a thirty-six week time period. Subjects showed significant gains in academic achievement, occupational aspiration, and vocational maturity when compared to controls; however, the strong results were produced with the investment of thirty-six hours of counselor intervention. In a similar study, Catron (1966) found significant differences between a vocational group treatment and a control group on self, ideal self, and ordinary person perceptions; however, the treatment consisted of twenty-one hours of group contact.

Hanson and Sander (1973) concluded after their study that "overshooters" became more realistic in group counseling, while "undershooters" responded better to individual counseling. When combining the criteria of career maturity; Super's indices of vocational maturity; realism of ability, achievement, interest self-estimates; and general occupational information, Jessee and Hiemann (1965) found rank order differences (individual over group over no treatment). Yet, when
they examined the dependent variables separately, no significant differences occurred among groups.

Behavioral Vocational Group Counseling. Narrow in scope and often focusing on an increase in information-seeking behaviors, behavioral groups have produced the most reported successful procedures (Cross, 1976). Two studies have used video tapes as a model to increase students' information-seeking behaviors (Thoresen and Krumboltz, 1968; Thoresen, Krumboltz, and Varenhorst, 1967). In a similar study, Krumboltz and Schroeder (1965) used a control group and two treatment groups 1) reinforcement of information-seeking behavior, 2) verbal reinforcement plus a role model, who discussed vocational topics. Significant differences were found between experimental and control groups on information-seeking; however, no differences were found on the variables of attitude toward planning, a career planning inventory, a vocational information survey or a vocational planning questionnaire among the groups.

Comparing individual and group counseling treatments, Krumboltz and Thoresen (1964) found significant differences in rank order for producing information-seeking behaviors (model reinforcement, reinforcement, films, and control). Once again, no differences occurred between group and individual counseling.

Although evaluations of group research have generally supported the effectiveness of this vocational intervention approach, a need remains for additional research to establish its role in the comprehensive developmental guidance program. "In the existing body of evaluative
literature for career interventions, the evidence suggests that myriad, diverse interventions result in small yet consistently detectable gains, despite gross differences in method, format, personnel, and resource costs. Is there no way of increasing the magnitude of the impact?" (Fretz, 1981). Fretz calls for better designed research to improve the validity of studies.

Criticisms of current vocational group research include 1) the limited number of studies (Fretz, 1981), 2) the lack of specified treatments (Fretz, 1981; Gazda, 1970), 3) the small samples (Gazda, 1970), 4) the inadequate instruments (Fretz, 1981), 5) the lack of presenting the qualifications of the group facilitator (Mahler, 1969), and 6) the failure to identify objectives and to propose testable hypotheses (Goldman, 1976; Krumboltz, 1967; Ohlsen, 1970). A need exists for well designed group evaluation studies that overcome the above weaknesses.

**Group Vocational Models**

A number of models have been proposed as vocational delivery approaches in a group context. For example, Hoffman and Cochran (1974) described five approaches to vocational group counseling. They range from didactic content orientation to focusing on an experiential process. These five groups share the common goals of self-awareness, career awareness, and decision-making; however, each of the groups has its emphasis on a different element. Some small group vocational approaches are discussed below.
Awareness of Career Decision-Making (ACADEM). "A program of activities that helps participants understand the educational, occupational, and personal aspects of life so that their decision-making will be smooth and rewarding" (Johnson, 1973, p. 2), ACADEM is a group counseling program that utilizes awareness of the decision-making process to enhance career development.

Deciding. Crites (1974a) introduced an instructional package focusing on values and decision-making skills designed for secondary student groups. Individual learning occurs from the group process and from interaction among counselees.

Other Groups. Proposing a developmental career group procedure, Healy (1973) described a five session model to explore concerns, learn about potentially suitable occupations, assess personal potential, plan a course of action, and implement the plan. Focusing on group interaction, techniques are used to support exploration and planning.

Four additional small group vocational programs are Tripod (Kirts and Fisher, 1973), Life-Planning Workshop (Hinkle and Thomas, 1971), Future Group (Sanz, 1973), and the Path Program (Figler, 1973).

These group models, based on developmental career guidance concepts, focus on personalizing the career development process, emphasize self-understanding and self-awareness, teach and encourage practice of decision-making skills, and facilitate the pooling and sharing of career information.
Vocational Exploration Group

One small group career guidance activity, Vocational Exploration Group (VEG), has received much attention over the last decade. VEG is a small group vocational package designed by Daane (1972) and published by the Studies for Urban Man, Inc. Combining group dynamics and world-of-work development theory, VEG is used to facilitate career decision-making for secondary students and adults. Based on the assumption that individuals possess a great amount of job knowledge with an inability to use that knowledge creatively and personally, the group is used to pool members' existing knowledge, to add information as members desire, and to encourage the development of more imaginative job personalizations.

VEG has combined self-concept theory and career development theory by focusing on assisting personal creativity to enhance career awareness; teaching the role of job satisfiers in personal fulfillment; instructing to understand conformity in the perception of jobs selection, and projection so that the perception of jobs will be expanded; facilitating feedback and self-disclosure for personal growth; and assisting in the understanding of the use of interest-and-skill concepts in job selection.

Group members, usually five, meet with a counselor for approximately two and one-half hours to complete eighteen activities (short program). An extended version is also available. It includes forty tasks and usually is presented in five daily, forty-five minute
sessions. The short program appears to be the method most used and researched.

The VEG process consists of five phases. Beginning with inclusion activities to reduce fears of exploration in phase one, the group is led into phase two that are cognitive activities including the learning of job functions (data, people, things) and job preparation. In phase three, members share information they have previously acquired about jobs. Phase four facilitates members to relate their personal characteristics to job demands and to job satisfiers. In addition, they discuss their preferences for further training. In this phase, the individual, with the assistance of the group, is aided toward identifying several appropriate career goals: In the final phase, the group focuses on individuals, helping each member design a plan which includes an occupational goal and a specified next behavior to help attain that goal (Patterson, 1979).

VEG is designed to be conducted by human service workers who obtain brief, but specifically designed, training. The highly structured VEG activities are introduced by the leader, who reads or paraphrases a specific statement. The structured context of VEG has generally eliminated such counselor variabilities as appearance, experience, race, age, and sex.

Two skills emphasized in leader training are 1) tasking (giving brief and clear statements of what activity is desired and clear instruction about how it can be accomplished); 2) selective responding
(giving attention to the person and task as appropriate). The first function is highly structured while the second is a more facilitative response.

VEG has been used in a wide variety of settings and has been adopted as a career development activity in a number of public school districts. Research results indicate that participants have an increased understanding of the world-of-work and have developed self-confidence in relation to career choice (Patterson, 1979).

**VEG Outcome Research**

Using VEG as an independent variable, studies have generally demonstrated that this treatment can be effective as a vocational counseling approach. When asked to evaluate VEG, a number of studies have reported that subjects and facilitators responded favorably to it (Beach, 1975; Bergland and Lundquist, 1975; Daane, 1972).

In a study to develop positive attitudes toward career exploration and to become more knowledgeable about the world-of-work, Johnson (1981) concluded that VEG improved those variables. Furthermore, the results were maintained over a six month period. In another study, Neeley and Kosier (1975) reported significant differences in information-seeking behaviors as well as more congruent self-other ratings with students who had participated in a VEG treatment.

As a process that emphasizes the personalizing of career information, four studies have examined VEG effects on the psychological variables of alienation, internal-external control, dogmatism, and employability perceptions. These studies found that the VEG scores as
compared with control group were significantly stronger on those variables (Crow, 1973; Daane, 1972; Frost, 1973; Powell, 1973).

Studies seemed to indicate that results on measures of career awareness that involve both self and work can be influenced by VEG; however, instruments measuring attitudes about work alone may not be influenced by VEG (Beach, 1975; Bergland and Lundquist, 1974; Bercun, 1977; Cross, 1976; Crow, 1973; Daane, 1972; Grubb, 1971; Williard, 1976). As a personalized group intervention, VEG appears to be most effective in helping group members mature psychologically toward career awareness.

In a study involving 1,659 subjects, VEG subjects demonstrated a higher ability to gain and remain on new jobs (Daane, 1972). In another study using fathers as observers of their sons while the latter participated in VEG, fathers increased in their awareness of their sons' job orientations (Grubb, 1971).

Strachan (1975) examined the receptiveness of high school students to vocational counseling after participating in VEG. Results indicated that significant increases were found in students participating in VEG.

**Summary of Research on VEG.** The studies evaluating VEG have supported the effectiveness of VEG to improve subjects' perceptions of careers and self as well as attitudes toward careers and self; furthermore, this technique is well-liked by group members and leaders. A lack of evidence concerning the effects of VEG on the more global measures of career maturity exists. No reported studies examined the effects of VEG on the career decision-making skills of subjects, nor has
this technique been compared with other career development interventions, a research design that Fretz (1981) stated as essential in the evaluation of vocational interventions.

The present study will compare VEG with a computer-assisted guidance intervention, as well as with a combined VEG plus CAG intervention. The effectiveness of VEG to facilitate career development on the variables of career maturity; decision-making; career-goal-directed behavior; and attitudes about self, school and work will be investigated. This study should allow conclusions to be made about VEG as a group vocational counseling method.

**Combined VEG plus DISCOVER Treatment**

In this section, research supporting the rationale for a combined treatment of VEG plus DISCOVER will be presented. Although a review of the literature reveals no study that has investigated the effects of a group exploratory vocational procedure combined with a computer-assisted method, Fretz (1981) has advocated studying the effects of a combination of independent variables on career development. He advocated that treatments would be more effective if one intervention emphasized the cognitive domain while the other, the affective. As they are from different ends of the personalized-mechanized continuum, a combined treatment of a vocational group and computer-assisted guidance should provide the recommended affective and cognitive activities. Theoretically, Tuckman (1973) advocated career guidance models that would focus on affective activities before proceeding to information-giving activities.
Clyde (1979) presented the case for the involvement of CAG systems into the comprehensive career guidance program. He suggested that CAG systems are designed to intervene in conjunction with other methods. Supporting this conclusion, Messena (1977), Myers et al. (1972), and Pyle and Stripling (1976) found significant results when using a combined treatment of individual counseling and a CAG system.

Ryan et al. (1980) concluded that the effectiveness of GIS appeared to depend on how it was integrated into the comprehensive career guidance program. In yet another study, Westbrook (1973) concluded that vocational information presented after subjects obtained self-information was more readily received. Thus, a group experience combined with a computer-assisted guidance system might maximize the facilitation of career development.

**Summary of the Related Literature**

The complexity of modern society and the increasing responsibilities of counselors have made the delivery of career guidance difficult. Several national and local studies have established the widespread need for improved career guidance. Since the late 1960's, many models have been proposed to assist in the delivery of career guidance; however, outcome research on these models has been limited.

The developmental, needs, and decision-making models have provided the theoretical bases for current vocational group counseling interventions and the computer-assisted guidance systems. Emphasizing personal growth and understanding as well as the learning of decision-
making skills, developmental approaches place career development within the context of total life development.

Developed in the 1970's, VEG, a small group vocational experience, and DISCOVER, a computer-assisted guidance system, are two approaches that have been used to assist in career guidance. Although research has generally supported these approaches, a need exists for further outcome research to investigate their effectiveness. No study to examine the combined effects of small group vocational guidance and computer-assisted systems has been conducted. A combined intervention would take advantage of the personalized treatment of the group process as well as the additional self-knowledge activities, decision-making skills, and information capabilities of the computer system.
CHAPTER III
RESEARCH METHODOLOGY

A multivariate experimental design was selected to study the effects of three different approaches to career guidance. DISCOVER, the most comprehensive of the third generation computer systems and an impersonal systems approach to career guidance, was selected as one experimental treatment. Its effects on the career development of eleventh grade students was studied. In addition, the Vocational Exploration Group (VEG), for which the major goal is to personalize career development, was examined as a second experimental treatment. Furthermore, a combined treatment using VEG and DISCOVER was conducted to study their interactive effects on career development.

Research Design

The Randomized Control-group Posttest Only design was chosen for this study. Subjects were selected carefully, using a random process. Groups were not pretested. Van Dalen and Meyer (1966) explain that this design controls the internal validity threat of history, maturation, and pretesting. In addition, the Randomized Control-group Posttest Only design controls for the external validity factor of interaction of pretesting and treatments. As in other rigorous designs, some question arises as to the possible external validity threat of the interaction of selection and the treatment as well as the reaction of the subjects to the experimental procedures (Isaac and Michael, 1979).
For this study the independent variable of career guidance intervention with four treatment levels was used. Four dependent variables were examined, using a multivariate design. The design could be illustrated as follows:

<table>
<thead>
<tr>
<th></th>
<th>Pretest</th>
<th>Treatment</th>
<th>Posttests</th>
</tr>
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<tbody>
<tr>
<td>I. VEG Group (E1)</td>
<td>---</td>
<td>X</td>
<td>T&lt;sub&gt;2&lt;/sub&gt;</td>
</tr>
<tr>
<td>II. DISCOVER Group (E2)</td>
<td>---</td>
<td>X</td>
<td>T&lt;sub&gt;2&lt;/sub&gt;</td>
</tr>
<tr>
<td>III. VEG plus DISCOVER Group (E3)</td>
<td>---</td>
<td>X</td>
<td>T&lt;sub&gt;2&lt;/sub&gt;</td>
</tr>
<tr>
<td>IV. Control Group (C1)</td>
<td>---</td>
<td>---</td>
<td>T&lt;sub&gt;2&lt;/sub&gt;</td>
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</table>

Essentially, the experimental design was implemented at each of five high schools. The data for all schools were combined and treated as though they were one experiment, a method recommended by Kerlinger (1973). However, data also were compared across schools.

Population

The population consisted of eleventh grade students from five high schools in the Orange County Public School District, Orange County, Florida. The high schools were Boone, Colonial, Evans, West Orange and Winter Park.

The county has nine high schools (10-12). The five schools in this study include approximately 3,900 of the district's 6,600 high school juniors. One school is south of downtown, one east, one northeast, one northwest and one west. The population of the five schools represents the various geographical, ethnic, racial, cultural, and socio-economic elements of the district as reported in the Orange County Schools' Statistical Report of 1980.
With approximately 81,000 public school students, the Orange County School District is the twenty-seventh largest in the country. The district's racial make-up is about 73 per cent white, 22 per cent black, 3 per cent Hispanic, and 2 per cent from other categories. The county's high schools reflect ratios for juniors as 77 per cent white, 18 per cent black, 2 per cent Hispanic, and 3 per cent from other categories.

Results of the most recent Orange County District Follow-up Survey (1980), indicated that 39 per cent of the graduates were employed full-time, 4 per cent were in the military service, 24 per cent were enrolled in two-year colleges, 31 per cent were enrolled in four-year colleges, and 2 per cent were in other categories. These statistics are based on a 36 per cent return of questionnaires mailed to all 1980 graduates.

Approximately 37 per cent of the school district's high school seniors took the 1980-81 Scholastic Aptitude Test (SAT). Results are reported below:

<table>
<thead>
<tr>
<th></th>
<th>M Math</th>
<th>M Verbal</th>
<th>M Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange County</td>
<td>465</td>
<td>421</td>
<td>886</td>
</tr>
<tr>
<td>Florida</td>
<td>463</td>
<td>424</td>
<td>887</td>
</tr>
<tr>
<td>South (excluding Florida)</td>
<td>445</td>
<td>409</td>
<td>854</td>
</tr>
<tr>
<td>Nationwide</td>
<td>466</td>
<td>424</td>
<td>890</td>
</tr>
</tbody>
</table>

On the 1980-81 American College Test (ACT), those Orange County seniors taking the test had a Mean Composite Score of 18.8, as compared to a Florida Composite Mean of 18.9, and an 18.5 Composite Mean Nationwide.

With a district policy for assigning secondary guidance counselors to students at a ratio of 1 to 500, the nine high schools employ 48 high school counselors, each certified by the Florida State Department of
Education. Due to the declining secondary enrollment over recent years, the counselor to student ratio for 1981-82 is approximately 1 to 425.

Sample Selection

The sample originally consisted of one hundred twenty students, twenty-four from each of the five participating high schools, who were randomly assigned to either experimental or control groups. A survey form (Appendix A) was given to each high school junior during a homeroom class. Students who had not already participated in a DISCOVER or VEG program and who indicated that they wished to participate in a program were listed alphabetically and numbered sequentially at each school. Then, using a random table of numbers (Kerlinger, 1973, p. 714), twenty-four students at each school were assigned to groups: Treatment Group I (E1), VEG; Treatment Group II (E2), DISCOVER; Treatment Group III (E3), VEG plus DISCOVER; and Control Group IV (C1). In addition, fourteen more students were identified as alternates.

Upon selection, the students chosen for one of the treatment groups (E1, E2, E3) were given a general orientation to the program to discuss 1) the purpose of the study, 2) the time of their first meeting, and 3) the procedure for completing the parent permission form (Appendix B). An outline of the orientation session is given in Appendix G.

If group members dropped out of the study before the study began, they were replaced by using designated alternate subjects. After the study began, no dropouts were replaced in the experimental groups. A total of sixteen students were not replaced from the original sample. Thus, 104 students provided data for the study. Table 3-1 summarizes
### TABLE 3-1

**DESCRIPTION OF THE SAMPLE**

1. By Groups

<table>
<thead>
<tr>
<th>SEX</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>VEG Group (I)</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>(%)</td>
<td>(%)</td>
</tr>
<tr>
<td></td>
<td>(46.4)</td>
<td>(53.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RACE</th>
<th>Wht</th>
<th>Blk</th>
<th>Hsp</th>
<th>Asian</th>
<th>Pac Isl.</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(89.5)</td>
<td>(3.5)</td>
<td>(3.5)</td>
<td>(3.5)</td>
<td>(0)</td>
<td></td>
</tr>
</tbody>
</table>

**Total = 28**

| DISCOVER Group (II) | 10  | 13  |
|                     | (%) | (%) |
|                     | (43.5) | (56.5) |

|         | 19  | 4   | 0   | 0    | 0    | 0  |
|         | (82.6) | (17.4) | (0) | (0)  | (0)  |    |

**Total = 23**

| VEG plus DISCOVER Group (III) | 8   | 18  |
|                               | (%) | (%) |
|                               | (30.5) | (69.5) |

|         | 22  | 1   | 1   | 1    | 1    |
|         | (85.2) | (3.7) | (3.7) | (3.7) | (3.7) |

**Total = 26**

| CONTROL Group (IV) | 11  | 16  |
|                   | (%) | (%) |
|                   | (40.7) | (59.3) |

|         | 24  | 3   | 0   | 0    | 0    | 0  |
|         | (88.9) | (11.1) | (0) | (0)  | (0)  |    |

**Total = 27**

**TOTAL = Males - 42 Females - 62 TOTAL N = 104**
### 2. By School

<table>
<thead>
<tr>
<th>School</th>
<th>SEX</th>
<th>RACE</th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Wht</td>
<td>Blk</td>
<td>Hsp</td>
<td>Pac.Isl.</td>
</tr>
<tr>
<td>Boone (I)</td>
<td>11</td>
<td>11</td>
<td>20</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(%)</td>
<td>(%)</td>
<td>(91.0)</td>
<td>(4.5)</td>
<td>(4.5)</td>
<td>(0)</td>
</tr>
<tr>
<td>Colonial (II)</td>
<td>5</td>
<td>18</td>
<td>19</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>(%)</td>
<td>(%)</td>
<td>(82.6)</td>
<td>(8.7)</td>
<td>(5.35)</td>
<td>(4.35)</td>
</tr>
<tr>
<td>Evans (III)</td>
<td>8</td>
<td>12</td>
<td>17</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(%)</td>
<td>(%)</td>
<td>(85)</td>
<td>(15)</td>
<td>(0)</td>
<td>(0)</td>
</tr>
<tr>
<td>West Orange (IV)</td>
<td>11</td>
<td>10</td>
<td>17</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(%)</td>
<td>(%)</td>
<td>(80.9)</td>
<td>(14.3)</td>
<td>(0)</td>
<td>(0)</td>
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<tr>
<td>Winter Park (V)</td>
<td>7</td>
<td>11</td>
<td>17</td>
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<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>(%)</td>
<td>(%)</td>
<td>(94.4)</td>
<td>(0)</td>
<td>(0)</td>
<td>(5.6)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22</strong></td>
<td><strong>20</strong></td>
<td><strong>23</strong></td>
<td><strong>20</strong></td>
<td><strong>21</strong></td>
<td><strong>18</strong></td>
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</table>

### SEX TOTALS

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTALS</td>
<td>42</td>
<td>62</td>
</tr>
</tbody>
</table>

### RACE TOTALS

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>90</td>
<td>9</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pacific Isl.</td>
<td></td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**TOTAL N = 104**
the demographic characteristics of the sample. The first section shows the sample by treatment groups, by age, and by sex categories. The next section shows the general demographic characteristics by school.

**Hypotheses**

Four hypotheses were used to help evaluate the effects of the treatments on the career development of high school juniors. The following null hypotheses were tested:

- **H₁**: There is no significant difference between the experimental (E₁, E₂, E₃) and control groups on career maturity, as measured by the Career Maturity Inventory-Attitude Scale.

- **H₂**: There is no significant difference between the experimental (E₁, E₂, E₃) and control groups on career decision-making, as measured by the Career Decision Scale.

- **H₃**: There is no significant difference between the experimental (E₁, E₂, E₃) and control groups on career-goal-directed behavior, as measured by visits to the career resource center.

- **H₄**: There is no significant difference between the experimental (E₁, E₂, E₃) and control groups on student attitudes about self, school, and work, as measured by the Student Attitude Inventory.

**Experimental Treatments**

The counselors who volunteered and who facilitated the treatments are certified Florida counselors working in the high school from which the subjects were selected. The VEG and VEG plus DISCOVER treatment counselors also are certified-trained VEG facilitators. Two counselors as well as two alternate counselors were chosen at each school. The counselors volunteered to facilitate one of the specific treatment groups. One of the counselors conducted the VEG group (E₁) and then the DISCOVER group (E₂), while the second facilitated the VEG plus DISCOVER group (E₃). The alternates were available in situations where the
assigned counselor might have been unable to participate. The methodology of this study was discussed in a group meeting with all counselors before the beginning of the study.

**VEG Treatment (E1)**

Group counseling methods in career development necessarily require the skills of the counselor to help personalize the experience. The Vocational Exploration Group (VEG) is a structured model for facilitating world-of-work and self-exploration in a small group context. Both the group experience and the group leader's training include standardized procedures. The purpose of VEG is to encourage creative thinking, increase personal motivation, and widen the participants' occupational knowledge.

The VEG treatment consisted of the standardized procedures, as specified in the VEG kit, for the short program (Appendix C). Approximately two and one-half hours are needed to complete the group experience. The VEG experimental groups met for one class period on three consecutive days, as scheduled by the counselors.

**DISCOVER Treatment (E2)**

DISCOVER, a computer-assisted guidance system, has been designed to facilitate the career development of students through a comprehensive, individualized program of guidance activities, including a) discovering self-information, b) systematically exploring occupations, c) teaching and low-risk practice of decision-making, d) relating self-information to occupational information, and e) assisting with information for the implementation of career choice. Providing career
intervention activities for each of these activities, DISCOVER assists the user with twelve modules of interactive content (Appendix D). Students working through the highly structured DISCOVER system are presented with an individualized, yet controlled sequence of activities. Such a system provides a standardized treatment for all subjects (Appendix D).

The experimental groups participating in the DISCOVER treatment received a counselor-directed fifteen-minute orientation to the DISCOVER system by a counselor. In the orientation, the students were "logged on" to the computer and given specific information on the published goals, the objectives, and the manipulation of the DISCOVER program (Bowlsbey and Rayman, 1980).

All students were informed that they should work sequentially through the entire sequence of DISCOVER activities. Each subject was instructed to schedule up to twelve hours of computer time on the Cathode Ray Terminal (CRT) over a five week period. Students were also informed that they could work together at the DISCOVER terminal. This interaction might have helped motivate students who work better in group activities. At the end of the orientation meeting, the students signed up for CRT time and received information on how to contact the counselor for assistance with technical problems that might arise.

As an individualized instructional program, the DISCOVER system does not require counselor–student contact; however, to help motivate and encourage the students to complete the entire program, counselors responsible for those experimental groups observed each student
individually at least twice during the student's scheduled DISCOVER time.

Students maintained a log of their activities on the CRT (Appendix E). If after three weeks of the experiment, the student had not completed eight hours of instruction, the counselor had an individual conference with that student to assist with scheduling the remaining hours of the program as well as to encourage completion. Upon completion of the final DISCOVER activity, each student informed the counselor that the task had been completed.

**VEG plus DISCOVER Treatment (E3)**

The VEG plus DISCOVER treatment was designed to investigate the effects on subjects' career development by using the VEG activity followed by the DISCOVER treatment. The rationale for using this treatment has been discussed in Chapter II (pp. 59-60). The treatment followed the same format as discussed in the VEG and the DISCOVER treatments.

At an initial group meeting designated by counselors, students assigned to this group received an explanation of the combined VEG and DISCOVER programs, including time commitment and goals. The counselor responsible then facilitated the VEG short program as described for the VEG experimental group.

Upon completion of the final VEG activity, each student received the DISCOVER treatment under the same format as discussed in the DISCOVER treatment. Upon completion of the DISCOVER tasks, each student was instructed to inform the counselor facilitator.
Criteria Instruments

In this study, four instruments were used to measure career development. They measured the dependent variables for the study.

Career Maturity Inventory-Attitude Scale (CMI)

One of the most widely used instruments to measure career development, the CMI, was constructed by Crites and consists of an Attitude Scale and a Competence Test. Each scale can be used independently. For the present study, the Attitude Scale was used.

The Attitude Scale is a self-report instrument designed to elicit the feelings and subjective reactions that an individual has toward making a career choice and entering the world-of-work. A fifty-question (50) true/false instrument, the Attitude Scale specifically measures involvement in the choice process, orientation toward work, independence in decision making, preference for career choice factors, and conceptions of the choice process. One raw score, the total correct answers, is reported. No national norms exist.

Crites (1973c) reported Kuder Richardson internal consistency coefficients of .74 and a test-retest reliability coefficient of .71 (Crites, 1973a). Other writers have reported internal consistency estimates as low as .58 and as high as .84, but most report near .70 (Hanna and Neely, 1978; Moore and McLean, 1977). Reports of stability have ranged from .60 to .78 with a median of .71 (Moore and McLean, 1977; Mowsesian and Holley, 1977). Although not extremely high, these coefficients are consistent with theoretical expectations and with other instruments measuring similar constructs.
Using the judgement of ten experts to select items, content validity was established during test construction. Criterion-related validity was established through a correlational study comparing the Attitude Scale to the "Readiness for Vocational Planning Scale." A correlation coefficient of .38 (p less than .01) was reported for these two instruments. Cited as evidence of criterion validity, another study reported a biserial r of .25 between the CMI and subjects' decisions about a career (Crites, 1973c).

By citing significant correlations with educational and personal adjustment measures, Crites (1973b) reported evidence of construct validity. Crites (1973a) also concluded that there were significant effects on attitude scores after vocational counseling; furthermore, Westbrook and Cunningham (1970) concluded that Attitude Scale scores increased with chronological age, supporting the contention that the instrument measures vocational maturity.

In the Eighth Mental Measurement Yearbook, Zytowski (1978) summarized that the CMI-Attitude Scale seemed free from response bias and correlated well with related instruments; however, he expressed the need for further CMI validity studies, citing the difficulty in measuring the hypothetical construct of maturity.

Generally, the evidence presented indicates that the CMI-Attitude Scale is one of the most used and strongest instruments for measuring career development; however, one must be aware that like all psychological instruments, there are questions about its validity.
Career Decision Scale (CDS)

The Career Decision Scale (Osipow, Carney, Winer, Yanico, and Koschier, 1976) was designed to identify barriers that prevent individuals from making career decisions. Utilizing Likert-type items, the instrument has nineteen (19) test questions. Questions one and two ascertain the certainty of career choice and school major, while items three through eighteen allow the user to indicate indecision factors. Item nineteen is unscorable, giving the respondent an opportunity to clarify previous responses, if desired.

Test-retest correlations of items are reported ranging from .70 to .90 for the total scale (Osipow, Carney, and Barak, 1976; Slaney and Palko-Nonemaker, 1981). To establish validity, a number of studies have been conducted to correlate the CDS with various populations that were undecided about careers prior to involvement in career development treatments. A series of studies reported by Osipow, Carney, and Barak (1976) indicated the potential of the instrument for identifying changes brought about through interventions designed to reduce career indecision. Taylor (1979) found a significant relationship between subjects' participation in a career planning group and an improved score on the CDS, indicating greater decidedness. Sutera (1977), Carney (1977), and Cranston (1978) reported similar results. Such correlations indicate construct validity.

significant "age" differences on the CDS with "older" students showing greater decidedness.

Conclusions drawn from the CDS validity studies indicate 1) the evidence of construct validity due to the CDS's correlation with other theoretical constructs, 2) a stable factor structure, and 3) criterion-related-validity based on its correlations with other instruments. Compared to other decision-making scales, the CDS probably is one of the strongest; however, one should be aware of the difficulty in measuring an abstract psychological construct.

The Student Attitude Inventory (SAI)

The Student Attitude Inventory (SAI) is a fifteen (15) item Likert-type instrument designed for this study (Appendix F). The first five items are questions related to attitudes about self. The second five items survey attitudes about school, and the final five focus on attitudes about work.

Eighty-six (86) high school juniors and seniors were given the instrument and then retested two weeks later to obtain test-retest reliability. The obtained coefficient was .77.

Content and construct validity were built into the instrument during design. Fifteen items for each of the variables of self, school, and work were listed. Seven professional educators, counselors and teachers chose the five items they judged to be the most powerful indicators for each of the variables. They then ranked those five items from most powerful (5) to least (1). For each variable the six items with the highest combined ratings were chosen to measure
student attitudes. After establishing test-retest reliability as reported above, the item with the weakest Pearson correlation in each of the three sections was eliminated, leaving a total of fifteen instrument questions. Such a procedure suggests that the instrument has both, though limited, content and construct validity.

Career-Goal-Directed Behavior (CGDB)

That students affected positively by career guidance interventions will seek further career assistance has been hypothesized. The career resource center is such a goal-seeking opportunity. If students in the experimental groups as opposed to those in the control group visit their school's career resource center more than those in the control groups, the conclusion is that the experimental treatments facilitated the career-goal-directed behavior (CGDB).

In order to assure that all students were aware of their school's career resource center, at each school a series of announcements was made to inform students of the center (see Appendix H). Upon completion of their experimental treatment, students involved in the experimental treatments (E1, E2, E3) received a tour of the career resource center. This tour was conducted by the alternate VEG counselor. Students were requested to sign-in whenever they used the center.

At the end of ten school days following the career center tour, the number of visits to the center were counted for all experimental and control subjects by using the center's sign-in sheet. These data became the measure for career-goal-directed behavior.
Administration of The Posttests

As theoretical constructs of career development, the dependent variables chosen to determine the effects of the experimental treatments were vocational maturity; career decision-making; exploratory career-goal-directed behavior; and student attitudes about self, school, and work. Treatment groups (E1, E2, E3) and the control group were measured across all four dependent variables.

Posttesting of the variables consisted of the administration of three standardized measures: the Career Decision Scale, the Career Maturity Inventory-Attitude Scale, and the Student Attitude Inventory. Measurement of the subjects' visits to the career resource center was also included.

Upon completion of the three treatment groups, a one week delay was given before the administration of the posttests. The VEG treatment was conducted during the fifth week of the experiment.

For the DISCOVER and VEG plus DISCOVER treatments, a five-week deadline was given to all subjects. For each day in which the computer was not operative, the deadline was extended one day.

At the end of the one week delay, experimental subjects were scheduled for a tour of the career resource center. Immediately following the tour, the subjects were given the three standardized posttests. Absent subjects were given the tour and posttests as soon as they returned to school.

Control group subjects took their posttesting on the same day as experimental group subjects. They were administered the three
instruments first. Upon completion of the posttesting, they were told the nature of the study and were given the opportunity to participate in a VEG plus DISCOVER group that would be conducted in approximately two weeks. Their group was led by the counselor responsible for the VEG plus DISCOVER treatment group. Absentees took the posttests upon returning to school.

All posttests were administered by the alternate VEG plus DISCOVER counselor. Upon completion of the posttests, all subjects received an individual appointment two weeks later. At that time, the counselor assigned as facilitator explained the purpose, goals, procedures, and instrumentation of this study. Members also had their posttest scores interpreted.

Ten days after posttesting, sign-in sheets for the career resource center were collected. The number of visits to the center for each subject was counted as a measure of career-goal-directed behavior.

**Experimental Procedures Chronology**

The data for this investigation were collected in the following sequential order:

1. All junior students at each of the five participating high schools completed the survey form in homeroom. Those who responded "yes" to the survey question about seeking assistance with career development and who had not participated in VEG or DISCOVER were included on an alphabetical list for each school.

2. From that list of students, subjects were selected randomly and assigned, in order, to one of the treatment or control groups.

3. At each school the treatment process was completed as follows:  
   1) Group I (E1) received the VEG treatment;  
   2) Group II (E2) received the DISCOVER treatment;
3) Group III (E3) received the VEG plus DISCOVER treatment; 
4) Group IV (C1) received no treatment as the Control Group.

4. Upon completion of the three treatments (E1, E2, E3) and a 
one-week delay, a tour of the career resource center was 
conducted for all experimental subjects. At the end of the 
tour, the treatment groups were administered the posttests. 
Upon returning to school absentees took the posttests.

5. Control subjects took the posttests on the same day as 
experimental subjects. Upon returning to school absentees 
took the posttests.

6. Ten days after posttesting, sign-in sheets for the career 
resource center were collected to count the number of visits 
that each subject had made to the career resource center.

7. Control group members had the opportunity to participate in a 
VEG plus DISCOVER group after the completion of the data 
gathering.

8. The scores gathered from each of the four measures were 
interval data. Scores for the CMI-Attitude Scale ranged from 
0-50; 16-64 on the CDS, and 15-60 on the SAI. On CCDB the 
number of visits to the career resource center was a whole 
number. For the CMI-Attitude Scale and CCDB, higher scores 
indicate increased career development. For the CDS and SAI, 
lower scores indicate greater career development.

9. Data analyses consisted of a multivariate analysis of 
variance. Since a significant F ratio was computed, the 
Student Newman-Keuls test of multiple comparisons was used to 
locate the specific significant variables. In addition, 
correlations were computed for the dependent variables, to 
determine their relationships.
CHAPTER IV

RESULTS

This study examined the effects of three interventions on the career development of high school students. To investigate the validity of these approaches, a Randomized Control-group Posttest Only design with multiple dependent and variables was chosen. Each of the three treatments and a control group were measured across four dependent variables: career maturity (CMI-Attitude Scale); career decision-making (CDS); student attitudes about self, school, and work (SAI); and career-goal-directed behavior (CGDB).

To evaluate the four null hypotheses, a multivariate analysis of variance was used, selecting the .05 confidence level to determine significance. Probably the most powerful and appropriate data analyses for educational research, multivariate methods have the capability of simultaneous analysis of both multiple treatments and dependent variables. Multivariate analysis produces an F ratio and if significant, further post hoc variable analyses are used to determine the location of the significant differences. The Student Newman-Keuls, a post hoc test of multiple comparisons, was conducted to locate the significant variables for this study. A second multivariate analysis was computed to test for significant differences among schools on the dependent variables.

A third statistical computation to determine the correlations among the dependent variables was conducted. This statistic was computed to
test the validity of the instruments as measures of career development as well as to help in understanding of the effects of the experimental treatments on the dependent variables. The data analyses were conducted using the Finn multivariate package and the Statistical Package for the Social Sciences (SPSS).

**Multivariate Analysis of Variance**

The results of the Finn computer program (Multivariance—Univariate and Multivariate Analysis and Covariance: A Fortran IV Program) are reported in Table 4-1. The F ratio and univariate F's for each of the dependent variables are reported in this table.

The Finn univariate analysis of variance (Table 4-2) indicates that the significant results in the study occurred only with the CMI and CDS dependent variables. This table also includes the means, standard definitions, and standard errors for the dependent variables. For the dependent variables, higher scores on the CMI and the CGBD measures indicate greater career development; conversely, lower scores on the CDS and SAI indicate increased career development. No significant differences occurred among any of the groups on the SAI or CGDB (Table 4-2). Since no difference appeared for these variables, further data analyses for the SAI and the CGDB was not statistically justified.

To further analyze the results of the study, a Finn multivariate analysis of variance was computed to determine if there were significant differences among schools on the dependent variables. Results are reported in Table 4-3. The F ratio for schools was not significant at the .05 level.
### TABLE 4-1

**FINN MULTIVARIATE ANALYSIS OF DATA FOR VARIABLES**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Univariate F</th>
<th>p less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMI-Attitude Scale</td>
<td>4.50</td>
<td>0.005*</td>
</tr>
<tr>
<td>CDS</td>
<td>2.98</td>
<td>0.035*</td>
</tr>
<tr>
<td>SAI</td>
<td>1.50</td>
<td>0.218</td>
</tr>
<tr>
<td>CGBD</td>
<td>1.43</td>
<td>0.238</td>
</tr>
</tbody>
</table>

*Multivariate analysis of variance, df = 12, F ratio = 1.767, p < 0.05*

*p < .05*
### TABLE 4-2

FINN UNIVARIATE F RATIOS FOR THE DEPENDENT VARIABLES

<table>
<thead>
<tr>
<th>GROUP</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
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</thead>
<tbody>
<tr>
<td>VEG</td>
<td>29.14</td>
<td>3.91</td>
<td>0.74</td>
</tr>
<tr>
<td>DISCOVER</td>
<td>28.43</td>
<td>3.79</td>
<td>0.79</td>
</tr>
<tr>
<td>VEG plus DISCOVER</td>
<td>28.69</td>
<td>3.65</td>
<td>0.72</td>
</tr>
<tr>
<td>CONTROL</td>
<td>25.52</td>
<td>4.64</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Univariate F for CMI for treatment groups = 4.50, $p < 0.005$

<table>
<thead>
<tr>
<th>GROUP</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>VEG</td>
<td>29.35</td>
<td>8.86</td>
<td>1.67</td>
</tr>
<tr>
<td>DISCOVER</td>
<td>27.83</td>
<td>7.84</td>
<td>1.64</td>
</tr>
<tr>
<td>VEG plus DISCOVER</td>
<td>29.81</td>
<td>8.77</td>
<td>1.72</td>
</tr>
<tr>
<td>CONTROL</td>
<td>34.74</td>
<td>9.64</td>
<td>1.86</td>
</tr>
</tbody>
</table>

Univariate F for CDS for treatment groups = 2.98, $p < 0.035$

<table>
<thead>
<tr>
<th>GROUP</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>VEG</td>
<td>25.89</td>
<td>6.65</td>
<td>1.25</td>
</tr>
<tr>
<td>DISCOVER</td>
<td>27.57</td>
<td>4.98</td>
<td>1.04</td>
</tr>
<tr>
<td>VEG plus DISCOVER</td>
<td>28.35</td>
<td>9.36</td>
<td>1.84</td>
</tr>
<tr>
<td>CONTROL</td>
<td>30.37</td>
<td>9.51</td>
<td>1.83</td>
</tr>
</tbody>
</table>

Univariate F for SAI treatment groups = 1.50, $p < 0.218$

No further analyses justified.
### CGDB

<table>
<thead>
<tr>
<th>GROUP</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>STANDARD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>VEG</td>
<td>1.18</td>
<td>3.46</td>
<td>0.65</td>
</tr>
<tr>
<td>DISCOVER</td>
<td>1.00</td>
<td>1.31</td>
<td>0.27</td>
</tr>
<tr>
<td>VEG plus DISCOVER</td>
<td>0.81</td>
<td>1.33</td>
<td>0.26</td>
</tr>
<tr>
<td>CONTROL</td>
<td>0.11</td>
<td>0.42</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Univariate F for CGDB treatment groups = 1.43, p < 0.238
No further analyses justified.
TABLE 4-3
MULTIVARIATE ANALYSIS OF VARIANCE FOR THE SCHOOLS

<table>
<thead>
<tr>
<th></th>
<th>CMI</th>
<th>CDS</th>
<th>SAI</th>
<th>CGDB</th>
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</thead>
<tbody>
<tr>
<td>Boone</td>
<td>29.45</td>
<td>27.18</td>
<td>27.77</td>
<td>0.41</td>
</tr>
<tr>
<td>Colonial</td>
<td>26.22</td>
<td>31.74</td>
<td>26.57</td>
<td>0.57</td>
</tr>
<tr>
<td>Evans</td>
<td>27.25</td>
<td>33.70</td>
<td>29.05</td>
<td>1.25</td>
</tr>
<tr>
<td>West Orange</td>
<td>28.10</td>
<td>31.38</td>
<td>26.29</td>
<td>0.86</td>
</tr>
<tr>
<td>Winter Park</td>
<td>28.83</td>
<td>28.56</td>
<td>31.17</td>
<td>0.83</td>
</tr>
</tbody>
</table>

<table>
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<th>CMI</th>
<th>CDS</th>
<th>SAI</th>
<th>CGDB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boone</td>
<td>3.25</td>
<td>8.55</td>
<td>5.81</td>
<td>1.01</td>
</tr>
<tr>
<td>Colonial</td>
<td>4.03</td>
<td>8.61</td>
<td>8.77</td>
<td>1.24</td>
</tr>
<tr>
<td>Evans</td>
<td>5.19</td>
<td>12.05</td>
<td>7.69</td>
<td>3.99</td>
</tr>
<tr>
<td>West Orange</td>
<td>3.96</td>
<td>7.05</td>
<td>6.47</td>
<td>1.28</td>
</tr>
<tr>
<td>Winter Park</td>
<td>4.16</td>
<td>7.77</td>
<td>10.54</td>
<td>1.34</td>
</tr>
</tbody>
</table>

F Ratio for the multivariate analysis of variance = 2.084, p > .05
TABLE 4-4

STUDENT NEWMAN-KEULS RESULTS

<table>
<thead>
<tr>
<th>GROUP COMPARISON</th>
<th>CMI</th>
<th>Total Sum of Squares</th>
<th>F Ratio</th>
<th>F Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>VEG and CONTROL</td>
<td>1154.73</td>
<td>9.823</td>
<td>0.003*</td>
<td></td>
</tr>
<tr>
<td>DISCOVER and CONTROL</td>
<td>982.02</td>
<td>5.785</td>
<td>0.020*</td>
<td></td>
</tr>
<tr>
<td>VEG plus DISCOVER and CONTROL</td>
<td>1027.70</td>
<td>7.609</td>
<td>0.008*</td>
<td></td>
</tr>
<tr>
<td>VEG and DISCOVER</td>
<td>735.41</td>
<td>0.425</td>
<td>0.517</td>
<td></td>
</tr>
<tr>
<td>VEG and VEG plus DISCOVER</td>
<td>749.70</td>
<td>0.191</td>
<td>0.664</td>
<td></td>
</tr>
<tr>
<td>DISCOVER and VEG plus DISCOVER</td>
<td>650.00</td>
<td>0.059</td>
<td>0.810</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GROUP COMPARISON</th>
<th>CDS</th>
<th>Total Sum of Squares</th>
<th>F Ratio</th>
<th>F Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>VEG and CONTROL</td>
<td>4934.00</td>
<td>4.655</td>
<td>0.036*</td>
<td></td>
</tr>
<tr>
<td>DISCOVER and CONTROL</td>
<td>4364.32</td>
<td>5.785</td>
<td>0.020*</td>
<td></td>
</tr>
<tr>
<td>VEG plus DISCOVER and CONTROL</td>
<td>4663.55</td>
<td>3.787</td>
<td>0.057</td>
<td></td>
</tr>
<tr>
<td>VEG and DISCOVER</td>
<td>3501.33</td>
<td>0.418</td>
<td>0.521</td>
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</tr>
<tr>
<td>VEG and VEG plus DISCOVER</td>
<td>4045.20</td>
<td>0.035</td>
<td>0.852</td>
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</tr>
<tr>
<td>DISCOVER and VEG plus DISCOVER</td>
<td>3325.27</td>
<td>0.687</td>
<td>0.411</td>
<td></td>
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</tbody>
</table>

*Significant at .05 level
Student Newman-Keuls Test of Multiple Comparisons

The results from the Student Newman-Keuls SPSS program are reported in Table 4-4. Data were computed for those variables with significant univariate F ratios, career maturity and career decision-making. In addition, the null hypotheses for the four dependent variables are evaluated.

Career Maturity

The Student Newman-Keuls results are found in Table 4-4. The first hypothesis tested focused on career maturity.

H$_0$ 1 There is no significant difference among the experimental and control groups on career maturity, as measured by the Career Maturity Inventory-Attitude Scale.

The data analyses indicated that when each experimental group was compared to the control group, each experimental group scored significantly (.05 level) higher on the CMI-Attitude Scale. Therefore, H$_0$ 1 was rejected. In addition, no significant difference occurred among experimental groups.

Career Decision-Making

The Student Newman-Keuls results are found in Table 4-4. The second hypothesis focused on career decision-making.

H$_0$ 2 There is no significant difference among the experimental and control groups on career decision-making, as measured by the Career Decision Scale.

For the CDS, significant differences occurred when comparing the VEG and the DISCOVER groups to the control group at the .05 level and the VEG plus DISCOVER subjects at the .057 level when compared with the control group. Thus, H$_0$ 2 was rejected. The differences reflect the experiment-
al groups as more career decided than the control group. Also, no significant difference occurred among the experimental groups.

**Career-Goal-Directed-Behavior**

Since no significant differences appeared on the univariate analysis (Table 4-2) for career-goal-directed behavior, the Student Newman-Keuls was not computed for that variable. Focusing on CGDB, $H_0^3$ is evaluated below.

$H_0^3$ There is no significant difference among the experimental and control groups on career-goal-directed behavior, as measured by visits to the career resource center.

For career-goal-directed behavior, no significant differences appeared among the experimental and control groups nor among the individual experimental groups. Therefore, $H_0^3$ was not rejected.

**Student Attitudes**

Since no significant results appeared on the univariate analyses (Table 4-2) for student attitudes, the Student Newman-Kuels was not computed for that variable. Focusing on student attitudes, $H_0^4$ is evaluated below.

$H_0^4$ There is no significant difference among the experimental and control groups on student attitudes about self, school, and work, as measured by the Student Attitude Inventory.

No significant differences occurred on the SAI among the experimental and control groups nor among the individual experimental groups. Null hypothesis $H_0^4$, therefore, was not rejected.

**Correlation of Dependent Variables**

Table 4-5 charts the data for the Finn correlations of the dependent variables. For the CDS and SAI, a lower score on the measures
indicates increased career development. For the CMI-Attitude Scale and CGDB, a higher score on the instrument indicates increased career development.

In conclusion, the data analyses results are summarized below:

1. To examine the data, a Finn multivariate analysis of variance was conducted, resulting in a F ratio that was significant (.05 level).

2. To further analyze the data, one computation of the Finn program is a univariate analysis for each dependent variable. For career maturity and career decision-making, significant F ratios were computed at the .05 level of confidence.

3. To search for the specific significant differences among variables, the Student Newman-Keuls test of multiple comparisons was conducted for the significant dependent variables, career maturity and career decision-making. For career maturity, significant (.05 level) differences occurred for each treatment group when compared to the control group. No significant difference occurred among experimental groups.

4. To summarize results for the second significant dependent variable, career decision-making, a significant difference occurred at the .05 level for the VEG and the DISCOVER groups and at the .057 level for the VEG plus DISCOVER group, when compared with the control group. No significant differences were found among treatment groups.
<table>
<thead>
<tr>
<th></th>
<th>CMI</th>
<th>CDS</th>
<th>SAI</th>
<th>CGDB</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMI</td>
<td>1.00</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>CDS</td>
<td>-0.62*</td>
<td>1.00</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>SAI</td>
<td>-0.33*</td>
<td>0.17</td>
<td>1.00</td>
<td>---</td>
</tr>
<tr>
<td>CGDB</td>
<td>-0.02</td>
<td>-0.09</td>
<td>0.14</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Significant at .05 level
5. To examine differences among schools, a second multivariate analysis was computed for the dependent variables. On this analysis, no significant (.05 level) differences occurred among variables.

6. To investigate dependent variable relationships, a correlation was generated that indicated a significant relationship (.05 level) between the dependent variables of career maturity and career decision-making; furthermore, a significant correlation was computed between career maturity and student attitudes. No significant relationship was revealed when correlating student attitudes to decision-making nor when comparing career-goal-directed behavior to other dependent variables.
CHAPTER V
SUMMARY, CONCLUSIONS, LIMITATIONS, IMPLICATIONS, AND RECOMMENDATIONS

Summary

A number of studies have investigated the effectiveness of secondary school career guidance. These researchers generally have discovered a great need for improved career development programs. As part of their recommendations, these writers have included the need for rigorous research to investigate career counseling interventions. Improved studies would help the secondary counselor to evaluate the effectiveness of different methods of career guidance.

The purpose of the present study was to investigate three different approaches to career guidance in order to ascertain the effects of each on the career development of high school students. One intervention examined was a small group vocational experience, VEG. Another approach studied was a highly individualized computer-assisted guidance program, DISCOVER. The third was a combination of the other two treatments, VEG plus DISCOVER.

Four dependent variables, career maturity; career decision-making; student attitudes about self, school, and work; and career-goal-directed behavior, were selected to determine the effectiveness of the three treatments.

To study the effectiveness of the career interventions on vocational development, a Randomized Control-group Posttest Only design with multivariate dependent and treatment variables was chosen. By using a carefully designed procedure, subjects were selected randomly.
and assigned to one of the treatment groups or the control group. The data were combined and treated as a whole as well as compared across schools.

The statistical analyses of the data consisted of a multivariate analysis of variance for the experimental groups across the dependent variables. In addition, a second analysis of variance was computed to test differences among schools. The post hoc Student Newman-Keuls test of multiple comparisons was conducted to determine the location of the significant differences among variables. Finally, a correlation of the dependent variables was generated.

The findings of the multivariate analysis of variance indicated a significant (.05 level) F ratio for the treatment or control groups on two of the dependent variables, career maturity and career decision-making. The post hoc Student Newman-Keuls revealed significant differences at the .05 level for the VEG and the DISCOVER groups when compared to the control group on both of these dependent variables. The VEG plus DISCOVER group was significant at the .05 level on career maturity and approached significance on career decision-making with a F probability of .057. These dependent variables, career maturity and career decision-making, had a correlation of .62 for combined group scores.

For the other dependent variables, career-goal-directed behavior and student attitudes, no significant differences occurred among the experimental or control groups. A significant correlation (.05 level) occurred between student attitudes and career maturity; however, the correlation generated between student attitudes and career decision-
making was not significant nor were correlations among career-goal-directed behavior and other dependent variables.

In reference to the null hypotheses presented in this study, two were rejected, indicating statistically that the treatment groups scored significantly higher on two dependent variables, career maturity and career decision-making. Two null hypotheses failed to be rejected on the variables of student attitudes about self, school, and work and on career-goal-directed behavior.

In this chapter the results are discussed. The organization of the remainder of the chapter include 1) conclusions, 2) limitations, 3) implications, and 4) recommendations.

**Conclusions**

**Career Maturity**

The concept of career maturity is a critical concept in career development. With career maturity, students will make more realistic, competent decisions. Career maturity attitudes involve decisiveness, involvement, independence, orientation, and comparison in career decision-making. The facilitation of career maturity is a most crucial goal in order to enhance personal growth.

Because $H_0$ was rejected, this study has demonstrated that an intervention can facilitate career maturity. Indeed, this research has established that three interventions used in this study can facilitate career maturity.
Career Decision-Making

One of the essential skills in vocational development is decision-making. Since all career development theories incorporate the concept of decision-making, it is considered a central construct of career development. Facilitation of decision-making enables students to cope more successfully with life's problems and challenges.

Since \( H_0 \) was rejected, the present research indicates that two of the interventions used in this study, VEG and DISCOVER, can facilitate significantly career decision-making. Furthermore, the VEG plus DISCOVER group closely approached significance (\( p < .057 \)). Due to the complexity of the design used and the small sample, this researcher concludes that a larger sample would also have produced a significant difference for the decision-making variable for the VEG plus DISCOVER group.

Student Attitudes about Self, School, and Work

Although student attitudes are important, the experimental treatments in this study did not affect them. Perhaps the specific information provided in the career interventions require a more specific measure. Examination of the instrument used (SAI) as compared with the CMI reveals that the CMI-Attitude Scale has three times as many questions and it requests more specific information. Possibly, the instrument used to measure student attitudes was not an effective measure for the experimental treatments used in this study.
Career-Goal-Directed-Behavior

Career-goal-directed behavior, a variable that has been facilitated by a number of career interventions, was not affected in the present study. The researcher questions the validity of this measurement for this study for the following reasons: 1) because of the time demands for the experimental treatments, students may not have had additional time to miss classes to visit the career resource center; 2) because this study was conducted late in the school year, students had other class commitments such as projects and exams; and 3) because of the short two-week career resource observation period, students might have been limited in their opportunities to visit the center.

With rejection of two of the four null hypotheses of this study, the three interventions are supported as facilitators of career development. As experimental treatments, they have demonstrated effectiveness in facilitating career maturity and decision-making. Adding support to developmental guidance theory, the study demonstrates that career interventions provided at appropriate times can facilitate the career development of high school students.

As measures of career development, this study further has established the validity of the CMI-Attitude Scale and the CDS. The correlation between the instruments as well as their value in obtaining significant results for treatment groups enhances their value as career development measures.
Limitations

The following might be limitations of this study:

1. The study population consisted of high school juniors, and generalizations to other grade levels might be approached cautiously.

2. The experimental treatments might have influenced the experimental subjects to participate in other activities that could have facilitated career development.

3. As in other research, counselor variability was difficult to control. In addition to the standardization of the treatments (p. 47, p. 60, p. 73, p. 74), an analysis of variance for the dependent variables was computed among the schools. The lack of significant difference among schools adds evidence that the treatments and schools were equal.

4. With losses up to one week of computer time, countywide technical hardware problems might have affected students involved in the DISCOVER and the VEG plus DISCOVER treatments. On the other hand, computer down time and hardware problems seem inherent in computer technology.

5. Difficulties occurred with some students not completing the entire DISCOVER activity. An effort was made to have subjects record their time spent on DISCOVER; however, accurate records were not available. Furthermore, counselors working at the schools commented that students were limited in time spent on the computer due to classroom responsibilities.
However, the significant results of the DISCOVER and VEG plus DISCOVER groups suggest that in spite of these difficulties inherent in the DISCOVER program, career development was facilitated.

**Implications**

The findings of this study suggest several implications for school counselors. Using any of the three career guidance interventions investigated in this study, counselors could facilitate the career development of students.

Computer-assisted guidance has generally been demonstrated as an effective approach for career guidance. The results of this study further support its value as an intervention. As one of the newest computer-assisted guidance systems, DISCOVER appears to hold promise as an effective approach to vocational guidance. Furthermore, the present study supports the value of DISCOVER as an isolated career development intervention.

In addition, the present study has added support for the use of VEG in career guidance. Few studies have concluded that VEG is effective in changing global dependent variables such as career maturity. As measured by standardized measures that have considerable reported reliability and validity, the present investigation has provided evidence that VEG as a single intervention can enhance the career development of high school students.

Another implication is that a combined VEG and DISCOVER approach also might facilitate the career development of high school students.
Since the professional literature has generally reported that a combination of interventions is more effective than single isolated interventions, counselors might consider the use of a combined computer-assisted and a small group vocational experience. However, the results of this study have not indicated that this approach is more effective than using either of the approaches individually.

Innovative career guidance programs might use these career interventions effectively. For example, in a required junior English course, a need always exists for individual or small group discussion of writing assignments. Counseling departments might utilize some students not involved in direct contact with the teacher by providing them with one of the career guidance activities. By incorporating a rotating system for the class, many students could benefit from the career development opportunity.

Since the DISCOVER treatment used in this study required little counselor supervision, an opportunity exists to make the computer program available to students during times when classes do not meet, such as, before school, after school, and during lunch. Another possibility would be for the schools to design a summer program in which interested students could be scheduled into one of the interventions.

Being cost effective and time efficient and producing research supported outcomes, VEG, DISCOVER, or VEG plus DISCOVER affords counselors the opportunity to build or expand their comprehensive career development program. Knowing the treatments have similar results, counselors may select a person-oriented, technologically-oriented, or
combination approach for their school.

Since the results of the study did not indicate that any one of the three interventions was more effective than any other, how might school counselors make decisions on which method to use? If all approaches produce similar results as the findings of this study suggest, then the answer to these questions should rely on the resources available to the guidance staff in each setting. Does the staff have the resources to purchase the training and kit to conduct VEG? Does the school have the hardware available to purchase the DISCOVER program? Are counselor motivation, interests, and skills directed toward small group work or toward computer technology? Is either VEG or DISCOVER available through district or state programs? What are the needs of the school? Which program is more costly? Answers to these questions should provide counselors with a clear idea of which approach is more effective.

Recommendations

With respect to the results of this study, this investigator recommends that school counselors and/or administrators make VEG, DISCOVER, or VEG plus DISCOVER available to students. Because of the effects demonstrated, schools should examine closely the feasibility of implementing at least one of the programs. Sharing the cost with other schools or districts might make implementation more practical.

In view of the findings that VEG, DISCOVER and a combined approach can be effective in career guidance, further investigation of their value seems needed. As standardized procedures, the effectiveness of
teachers, peer counselors, occupational specialists, volunteers, or paraprofessionals as facilitators of these interventions should be studied.

Investigating the effectiveness of the treatments across different grade level, cultural, racial, or sexual populations deserves attention. Research involving low achievers, non volunteers, potential dropouts, and exceptional education students would provide valuable information for the use of these career interventions. Additional attention could be focused on the behaviors of students, not just on the theoretical constructs of the variables after the career guidance activities.

In career guidance, the need for longitudinal studies exists. An investigation of the career maturity and decision-making skills of students six months or one year after intervention would enhance the practicing counselors' understanding of the approaches.

In conclusion, the significant results of this study are encouraging. Since experimental subjects were demonstrated to be more career mature than control subjects, the findings indicate that these career guidance programs can be effective. These conclusions add support to the validity of VEG, DISCOVER, and a combined approach as career guidance tools. Although further related studies are needed and encouraged, clear implications for practicing school counselors are apparent.
CAREER PLANNING SURVEY

Name ____________________________

Last ________ First ________ Middle ________

School ______________________________

Sex ( ) M ( ) F

Our Guidance Department is offering a Career Planning Program for a limited number of Juniors. This program will help you become aware of career opportunities and help you with career plans. Students selected to participate in the program will meet during class time and will be expected to make up all class work missed.

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

1. Would you be interested in participating in this program? Check one:
   ( ) no interest  ( ) some interest  ( ) interested  ( ) very interested  ( ) extremely interested

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

2. Have you ever participated in a "VEG" group? Check one:
   ( ) yes  ( ) no  ( ) don't know

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

3. Have you ever participated in "DISCOVER," a computer assisted program? Check one:
   ( ) yes  ( ) no  ( ) don't know

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

4. If you answered "yes," how many hours was this program? Check one:
   ( ) less than 5  ( ) between 5 and 10  ( ) over 10

   * * * * * * * * * * * * *
APPENDIX B

PARENT PERMISSION FORM
Parent Permission Form

Date ____________________  ____________________

Student’s name ____________________

Dear Parent,

A county-wide guidance study to help students in their career planning and decision-making is being made. Your son/daughter has volunteered and been selected for this program.

It is believed that this program will help your student gain information about careers as well as help him/her with career decisions and career planning.

I give permission for my son/daughter to participate in the program.

( ) Permission granted  ( ) Permission not granted

Parent's signature ____________________
APPENDIX C

VOCATIONAL EXPLORATION GROUP TASKS

Short Program

1. Purpose of Group—Leader briefly explains purpose and structure of the group.

2. Introductions by Members—Members pair up for a few minutes of conversation, then turn back to the circle and introduce their partner to the rest of the group.

3. Million Dollar Story—Each member introduces himself by telling what he would do if he had a million dollars tax free.

4. Job Matrix—Leader uses chart depicting job functions—data, people, things—and job entry—train on the job, special skill, or college—to encourage discussion and stimulate members to think of jobs and place them in the appropriate cell.

5. Naming Most and Least Liked Jobs—Each member tells the group a top and a bottom job for himself—the job he would most and least like to have if circumstances were right.

6. Cool Seat—Each member in turn sits in the extra chair while other group members given them their impressions of a top and a bottom job for him.

7. Response to Cool Seat—Leader facilitates discussion on member's feelings and thoughts during and about the Cool Seat experience.

8. Job Inventory Part I—Members complete section of the Job Inventory as a record of their thinking of jobs for themselves at that point in the group. Each job listed is assessed in terms of Job Function and Entry Level.

9. Wall Posters and Pictures—Group members generate lists of jobs and place them on a chart under the appropriate job function category. Memory and pictures are used to stimulate thinking.

10. Job Information Booklets—Leader distributes booklets, explains contents. Each member finds five more jobs not listed on charts and records them in the appropriate category on the wall chart.

-110-
11. **Job Satisfiers**—Leader introduces concept of satisfaction derived from work for discussion. Members select most important, least important, and a middle job satisfied for themselves from stimulus chart.

12. **Interest-Skills**—Leader introduces idea of interest-skills as job demands for discussion. Members select most important, least important, and a middle interest-skill for themselves from chart.

13. **Jobs and Training**—Members name jobs for themselves that they would most and least like in categories of "need more training" and "have enough training."

14. **Job Inventory Part II**—Members complete section II of the Job Inventory with jobs that reflect their thinking in the group at this point and mark each job listed in terms of its job function, job entry level, satisfiers possible and interest-skills demanded.

15. **Job Choice Summary**—Members name a job that seems to meet their needs in all areas of job choice discussed and use the summary chart to describe how their choice fits them in the areas of job function, entry level, satisfiers, and interest-skills.

16. **Expanded Choice**—Each member names three more jobs that might meet his needs in each of the four choice areas.

17. **Next Step**—Each member decides on his goal area and with the assistance of other group members decides on a specific next step toward that goal. Members write what they will do, how they will do it, and when they will do it.

18. **Closing**—Members reread their "Next Step" for rest of group to react to and/or make additional suggestions. Arrangements are made for any follow-up meetings.
APPENDIX D

DISCOVER MODULE DESCRIPTION

ENTRY. The entry module introduces the user to the many special features of the system and teaches him or her how to use the terminal. It monitors each person's use of DISCOVER, recording each entry and exit point to facilitate long-term use and review. Each user has the opportunity to complete an on-line Survey of Career Development. This survey is scored and the results serve as the computer's guide in suggesting which modules of the system will be most appropriate for a given user.

1a. UNDERSTANDING MY VALUES. This module contains a number of experiences that lead the user to think about what a value is, to analyze personal values, and to decide upon actions to implement those values. The module defines nine specific occupational related values as identified by Katz. The student rates the personal importance of each of these nine values and may then ask the computer to search its data file for occupations that can provide the combination and weighting of the values assigned by the user. This list of occupations is retained for later use in the system.

1b. PLAYING A VALUES GAME. This module is a monopoly-like game developed by the DISCOVER team that may be played by one or two persons. The object of the game is to provide users with a low-risk exercise in which they can make career decisions based on preestablished personal values. The game is designed to provide the user(s) with insight into the relationship that exists between personal values, career decision-making and career goals.

2a. LEARNING TO MAKE DECISIONS. This module attempts to teach the planful decision-making strategy by presenting the steps in example and flowchart form. The system provides a number of exercises designed to illustrate and provide practice in alternate decision-making strategies (impulsive, delaying, painful) and assists the user in identifying his or her present style of decision-making.

2b. PRACTICING CAREER DECISIONS. This module makes use of a "career decision tree" as an organizing principal for understanding how decisions affect occupational choice. The career decision tree structure is used to show the key decisions that lead to entry into a given occupation, to plot a given user's course up the branches of the tree, to stimulate the career paths of others, and to allow the user the opportunity to "play" his or her own life in a variety of ways by making decisions in this low-risk simulation.
APPENDIX D (continued)

3a. LEARNING HOW OCCUPATIONS CAN BE GROUPED. This module presents the world-of-work by way of two organizing principles: the data people, things, ideas division (which is the American College Testing Program's refinement of the Dictionary of Occupational Titles classification system) and the Holland system. A number of exercises are presented to give the student practice in using these classification systems; the student's responses are monitored for the purpose of providing more instruction, if needed.

3b. BROWSING OCCUPATIONS. This module makes use of the Holland classification system presented in module 3a as an organizational structure by which the user can browse the world-of-work. The module allows the user to touch any two points of the Holland hexagon and to receive a list of occupations that fall in that particular segment of the circular world-of-work. The user may select titles from the list and receive a one-display description of the occupation's work setting and work tasks. This module contains descriptions of 320 occupations.

4. REVIEWING MY INTERESTS AND STRENGTHS. This module is Holland's Self-Directed Search delivered by computer. This instrument is a self-report of the user's career-related interests, experiences, and competencies. The data collected from the items on the instrument, give the user a focus for exploration in the world-of-work. The results of the instrument are interpreted to the user "on-line."

5. MAKING A LIST OF OCCUPATIONS TO EXPLORE. This module provides the user with five alternate ways to make a list of personal and vocational options: (a) by relationship of occupations to personal work values, (b) by use of the results of the Self-Directed Search, (c) by selecting titles from a list of occupations by the terminal, (d) by combining selected occupational characteristics (such as salary level, place of work, level of training) or (e) by relating favorite school subjects to occupations.

6. GETTING INFORMATION ABOUT OCCUPATIONS. This module allows the user to get extensive information about the occupations on his or her list. By the voluntary selection of as many as 21 questions, the user may receive information about an occupation, its duties, benefits and limitations, educational requirements, future outlook, and additional sources of information. The user may also review his or her own student record (of grades in related courses, of related work or course experience, or of present rank in class, for example) against the requirements of the occupation or its prerequisite training. The user leaves this module with a list of occupations in which he or she has serious interest. This list may be a shortened form of the list with which the user entered the module, or it may be a new list that has been generated on the basis of information gathered in this module.
APPENDIX D (continued)

7. NARROWING MY LIST OF OCCUPATIONS. The user enters this module with the list of occupations from the previous module or with a new one that he or she generates at the beginning of the module. The purpose of this module is to assist the user in narrowing the list further so that he or she leaves the module with a first-choice occupation in mind and a limited number of others in priority order. This narrowing is assisted by the capability to (a) ask for additional information about any occupations on the list, (b) compare information about two occupations, and (c) analyze the remaining occupations in light of identified work values, desired level or training, and interest and competence.

8. EXPLORING SPECIFIC CAREER PLANS. The user enters this module with one specific occupation in mind at a time. The system identified for the user all of the possible paths of training to the selected occupation. The user may choose the path of entry that she or he wishes to explore in depth and branch to any of the nine submodules of module 8. Each of these submodules is divided into two major sections: an informational section that provides extensive information about the opportunities, limitations and vagaries of each potential path of entry, and an extensive data file of information that can be searched and displayed. The titles of the submodules are as follows:

8a. Local jobs.

8b. Financial aid, including an on-line assessment of student financial need based on short form of ACT's Preplanning Financial Statement.

8c. Apprenticeships.

8d. Four-year college information and search, including a file of all four-year colleges, and universities in the nation.

8e. Community and junior colleges, including a file of all community and junior colleges in the nation.

8f. Graduate and professional schools, including a national file of graduate and professional schools.

8g. Technical and specialized schools, including a file of over 11,000 technical and specialized schools.

8h. Continuing education.

8i. Military information and search, including a file of over 400 military occupations.
<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME-IN</th>
<th>TIME-OUT</th>
<th>DISCOVER MODULE</th>
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DISCOVER

Student ___________________________  Last  First  Middle
School ___________________________
APPENDIX F

STUDENT ATTITUDE INVENTORY
Below is a list of general feelings about yourself. If you strongly agree with the statement circle a "1"; agree circle a "2"; undecided a "3"; disagree circle a "4"; strongly disagree circle a "5".

### Student Attitude Inventory

<table>
<thead>
<tr>
<th>Grade</th>
<th>Male</th>
<th>Female</th>
<th>Race</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am pleased with where I am in my life</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Most people like me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. I am important</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>4. I have plans for my future</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>5. I understand myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>6. There are adults at my school who care about me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>7. There is an adult at school who listens to me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8. A counselor at school cares about me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>9. My school counseling program has shown me some interesting things about careers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>10. School has helped me learn how to make decisions</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>11. I feel good about my future plans</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>12. I know I can make appropriate decisions about my future as they arise</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>13. I have talked with others about my future plans</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
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<tr>
<td>14. I feel others have listened to me concerning my future plans</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>15. I am capable of making good decisions about my future</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</table>
APPENDIX G

OUTLINE OF ORIENTATION SESSION

I. Introduction
   A. Goals and Purpose
   B. Activities
   C. Parent Permission Form
   D. Time of First Group Meeting

II. Questions and/or Discussion
APPENDIX H
ANNOUNCEMENTS

In order to improve awareness of all students of the Career Resource Center at each participating high school, the following announcements were made as a part of the study.

Announcement #1: This announcement was made for three consecutive days at the beginning of each school's DISCOVER and VEG plus DISCOVER treatment period:

"Students, don't forget our school's Career Resource Center . . . it's a place you can go to discover all kinds of information on careers, educational opportunities, and colleges . . . it is located ______ (a phrase was placed here appropriate for each school) . . . stop by and visit there soon!!"

Announcement #2: This announcement was made for three consecutive days beginning the day that posttesting for the experimental groups took place:

"We have a number of students who have been asking questions about careers and college . . . This is just a reminder for all students that the Career Resource Center is a place where you can get all kinds of help on career plans . . . it is located (a phrase was placed here appropriate for each school) . . . stop by and receive lots of help on your career planning!!"
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BIOGRAPHICAL SKETCH

David L. Glaize was born in Lincoln, Nebraska, in 1947. His father served twenty years in the Air Force and David received elementary and secondary schooling in Lincoln, Nebraska; Spencer, Iowa; Wichita, Kansas; Reno, Nevada; Denver, Colorado; Big Springs and San Antonio, Texas; and Orlando, Florida. He received a B.A. in sociology from the University of South Florida, Tampa, Florida, which he attended on a baseball scholarship. After six months active duty with the United States Marine Corps, he earned an M.Ed. degree in guidance and counseling from the University of South Florida in August, 1971.

David was employed by the Orange County, Florida, School System in August, 1971, working as a counselor at Conway Junior High School where he remained for five years. For the last six years, he has been a counselor at Colonial High School in Orlando and is beginning his fifth year as Director of Guidance. While at Colonial, David also has been involved in teaching adult education, teaching adjunct for a local college, maintaining a part-time private counseling practice, and consulting with schools and private agencies.

In September, 1978, two weeks after his daughter Whitney was born, he began work on the Ed.D. degree in school counseling. David is married to the former Sandra Lee Pascall of Clearwater, Florida. She is employed by Orange County Schools as a school social worker. Dave and Sandy have two daughters; Whitney, three; and Leslie, one.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Robert Myrick, Chairman
Professor of Counselor Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Paul W. Fitzgerald
Professor of Counselor Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Gordon D. Lawrence
Professor of Instructional Leadership and Support

This dissertation was submitted to the Graduate Faculty of the Division of Curriculum and Instruction in the College of Education and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Education.

August, 1982

Dean for Graduate Studies and Research