This is to certify that the

dissertation entitled

The Relationship Between Student Characteristics And The Effective Use Of A Computer-Assisted Career Guidance System

presented by

Alan J Farber

has been accepted towards fulfillment of the requirements for

Ph.D. degree in Counseling Psychology

Major professor

Date July 22, 1986

THE RELATIONSHIP BETWEEN STUDENT CHARACTERISTICS AND THE EFFECTIVE USE OF A COMPUTER-ASSISTED CAREER GUIDANCE SYSTEM

By

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

School of Health Education, Counseling Psychology
and Human Performance

1986

ABSTRACT

THE RELATIONSHIP BETWEEN STUDENT CHARACTERISTICS AND THE EFFECTIVE USE OF A COMPUTER-ASSISTED CAREER GUIDANCE SYSTEM

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Some researchers have suggested that certain individuals are more likely than others to benefit from the use of computer-assisted career guidance systems (CACGS). The present study sought to examine the influence of personal and demographic traits on the outcome of CACGS use. The CACGS under investigation was the System of Interactive Guidance and Information (SIGI). It was predicted that task oriented participants, in comparison to people oriented participants, would benefit more from the use of SIGI. It was further predicted that a relationship would exist among the three dependent variables under investigation. College students were classified according to their Holland's typologies (people or task orientation), sex, and previous experience with CACGS. The outcome of SIGI use was measured by three dependent variables: evaluations of SIGI (as measured by an investigator-created rating scale), time spent on the system, and post-SIGI levels of career decisiveness (as measured by the Career Decision Scale).

Participants were 69 university undergraduate men and women. Prior to using SIGI, the students completed a SIGI User Information Form, Career Decision Scale, and Vocational

Preference Inventory. Upon completion of SIGI, they completed the Career Decision Scale, and the SIGI Evaluation Questionnaire. Regression analysis did not reveal any statistically significant relationship between the three independent and dependent variables. However, significant relationships were found between two of the three pairings of dependent variables: SIGI evaluations and post-SIGI career decisiveness; and SIGI evaluations and time spent on SIGI.

ACKNOWLEDGMENTS

I would like to acknowledge the help and support of my dissertation committee, Drs. Linda Forrest, Gordon Williams, and Casimer Heilman. Special thanks to my dissertation chairperson, Dr. Richard Johnson, for his scholarly advice and genuine concern. The excitement I feel about career counseling and research was largely fostered by Drs. Johnson and Forrest. I admire their scholarship, and appreciate their guidance.

I appreciate the cooperation and assistance of the professional and support staff at the Counseling Center, Brody Hall, Wonders Hall, and Learning Resource Center. My deepest gratitude goes to Cheryl and Sam Baer for assisting in the procurement of data, and Douglas Rosenthal for his assistance in the analysis of data. I am especially appreciative of the 69 students who graciously volunteered to participate in this study.

This work is dedicated to Mary Theresa Gawrys - my friend, wife, and heart's desire. Thanks Gaws.

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CHAPTER I

INTRODUCTION

Introduction to the Problem

Empirical evidence and common sense alike suggest that vocational clients' personal characteristics may influence their reaction to, and the effectiveness of, particular treatment interventions. Three subject areas have received considerable attention in the psychology and vocational counseling literature: (a) Attribute-treatment interaction research directed at determining whether the effects of different therapeutic methods are influenced by the cognitive or personality characteristics of the client, (b) Studies using Holland's Occupational Themes to categorize clients according to stated vocational preferences, and (c) Outcome studies examining the effectiveness and impact of computer assisted career guidance systems. The present attribute-treatment interaction study represents an attempt to incorporate Holland's Occupational Themes in assessing the effectiveness of, and user reactions to, a computer assisted career guidance system.

Computers have been used to assist career counselors in providing up-to-date career information and guidance for approximately 20 years. Research on such computer assisted career guidance systems (CACGS) has provided evidence that

the systems are generally well received by counselors and users alike. Numerous studies have compared the effectiveness of "traditional" (non-computer assisted) vocational counseling to the use of computer-based systems (English, 1974; Glaize & Myrick, 1984; Grisham, 1978; Maola & Kane, 1976). Other outcome investigations have measured the comparative effectiveness of two computer assisted programs (Kapes, Borman, & Kimberly, 1985). Because the studies have involved a variety of computerized systems, traditional counseling approaches, and criterion measures, findings have been equivocal. However, in general, results of such studies indicate that the computerized systems are favorably evaluated by users and counselors, provide useful information, increase the users' vocational decidedness, and encourage appropriate vocational planning and decision making.

Far less is known about the differential effectiveness of CACGS among various user populations. Only one study (Melhus, Hershenson, & Vermillion, 1973) has been specifically devoted to assessing the "best fit" between different kinds of users (according to vocational counseling readiness) and different types of treatment (a computerized career information delivery system versus "traditional" vocational counseling). The findings of this study strongly suggest that the efficacy of CACGS may differ according to users' personal characteristics.

Several anecdotal reports have appeared in the

literature describing individuals who are likely users, non-users, beneficiaries, and non-beneficiaries of CACGS (Haring-Hidore, 1984; Walz, 1984). The goal of the present study is to provide further empirical support for the notion that users' personal traits differentially influence the effectiveness of CACGS. The CACGS under investigation is the System of Interactive Guidance and Information (SIGI), a widely used and researched program designed to provide career guidance and occupational information. Specifically, it is predicted that SIGI users' degree of "task orientation" and "people orientation" will differentially influence their evaluations of SIGI, time spent on SIGI, and post-SIGI career decidedness. Task oriented individuals tend to gravitate toward, and function most effectively among, things rather than people. The reverse is true of people oriented individuals. Because SIGI is a pre-programmed, systematic, and largely non-social activity, task oriented users would be expected to score higher than people oriented users on the three aforementioned dependent measures. Orientation toward tasks or people will be determined through the use of the Vocational Preference Inventory, a personality measure and interest inventory designed to categorize people according to Holland's six Occupational Themes.

In addition, it is predicted that a positive correlation will exist among the three criterion measures under investigation. For example, a user spending an above

average amount of time on SIGI would be expected to favorably evaluate the system, and demonstrate a high level of career decidedness following its use. SIGI users' degree of career decidedness will be assessed by the Career Decision Scale. An investigator-created questionnaire will be employed to determine user ratings and time spent on SIGI.

Importance of the Study

It is, or should be, the goal of every career counselor to match treatment approaches to clients according to their personal traits and needs. The popularity of career development theories and vocational maturity measures attest to researchers' and practitioners' recognition of individual client differences in terms of vocational identity, development and treatment needs. Unfortunately, however, vocational counseling and guidance practices often minimize or ignore the unique client-specific traits that may be influencing the efficacy of the treatments in use. The two major reasons for such a de-emphasis on attribute-treatment interactions in career counseling appear to be: (a) Insufficient empirical evidence supporting the need to contour treatments according to client traits, and (b) Insufficient funds, resources, and personnel to provide the needed individually client-tailored interventions.

The present study addresses both of the aforementioned

issues. First, it represents an attempt to demonstrate that various client personal and demographic traits influence the outcome of CACGS use. Second, it involves a potentially helpful, seemingly nonthreatening, enjoyable, and cost-efficient career guidance procedure that may serve to alleviate some of the burden of understaffed and overworked career guidance programs, while providing a valuable service to clients.

Despite the relative dearth of empirical evidence to support their use, CACGS have been overwhelmingly embraced by the career guidance community. Nonetheless, warnings have sounded in the professional literature against the indiscriminant use of CACGS (Cairo, 1983; Wrenn, 1970). Some fear that CACGS's favorable user ratings, cost-effectiveness, and minimal need for human intervention may result in their misuse, much in the fashion of the common misuse of interest inventories with inappropriate clientele or by unqualified personnel. Furthermore, global generalizations have been made concerning the merits and outcomes of CACGS despite questionable research practices and vast differences between the various systems' formats, contents, purposes, and intended users.

The present study represents one in a recent and rapidly increasing attempt to accurately and systematically evaluate this relatively new career counseling and guidance procedure. The use of Holland's typologies, undoubtedly the most well accepted and empirically sound vocational

classification system, provides further credence and support for the present attribute-treatment interaction study. Since Holland's typologies are universally recognized and employed by career counselors, the findings of the present study may have direct applicability and relevance to everyday career guidance procedures. For example, counselors may chose to offer SIGI alone to Realistic and Investigative students, while offering it in conjunction with group discussions with Social and Enterprising students. Finally, such a study may serve to stimulate further attribute-treatment interaction CACGS research involving other computerized systems and/or other independent and dependent variables.

CHAPTER II

REVIEW OF THE LITERATURE

Computer Assisted Career Guidance Systems

Computer assisted career guidance systems (CACGS) are currently one of the most widely used applications of computer technology in the counseling field (Sampson, 1983). Authors in the area of career counseling have predicted computer-based approaches to be one of the priorities of the 1970s and beyond (Campbell, 1974). In 1984, Katz estimated that approximately 1,000 post-secondary institutions were using the best-known computer-based guidance and information systems. Originally run solely on mainframes, most programs are now available in microcomputer versions, making them far more accessible and affordable to career counselors and guidance personnel. Although no current estimate of the number of microcomputers in career guidance exists, their use is expanding rapidly. For example, according to Lambert (1984), few if any microcomputers were in use in Wisconsin in 1980-81. In 1981-82, about 25 sites used microcomputers, and in 1982-83 over 125 sites had career information available on microcomputers. Their proliferation is primarily due to the computer's ability to provide ready access to extensive amounts of updated information in a convenient and relatively inexpensive fashion.

CACGS are programs in which a user communicates directly, by means of a typewriter or visual display screen terminal, with the computer's prestored text and files to receive vocational and educational information designed to assist with personal career decision making (Rayman, Bryson, & Bowlsbey, 1978). Computer assisted guidance is currently available to a variety of users in a number of settings, including secondary schools, two- and four-year colleges, technical schools, state employment offices, public libraries, correctional institutions, and private career counseling agencies.

Sampson and Pyle (1983) note that the use of computerized systems has increased as a result of the realization that there are aspects of the helping process that can be more effectively handled by a computer than a counselor. Growth of CACGS continues due to the increasing demands on inadequate numbers of career counselors to have relevant, accurate, and up-to-date information available to increasing numbers of students (Kapes, Borman, & Kimberly, 1985). Computers have been recommended as a means of freeing the counselor from the routine tasks of information dissemination (Minor, 1970) and "search-retrieval" activities (Cooley, 1964). White (1981), in pointing out that the computer is not competition for the counselor but rather an aid to the completion of mundane tasks, notes that "people will matter more not less" (p. 54). The computer-based program affords the counselor the greater

opportunity to focus on the more affective and interpersonal aspects of career choice (Harris, 1972; Jacobson & Grabowski, 1981; Lackner & Feller, 1984). It has been observed that counseling psychologists and counselors-in-training tend to dislike and/or actively avoid career counseling (Pinkney & Jacobs, 1985). If the computer proves capable of handling the more bromidic tasks, career counseling may be viewed more favorably by professionals in the field.

In recent years technological advancements have allowed CACGS to provide guidance and teaching services previously performed by counselors. The capability of CACGS, and the point at which human intervention becomes necessary, has been the subject of much debate in the career counseling literature. Some studies have suggested that CACGS alone are as effective as, or more effective than the counselor at providing occupational information (Jones, 1976; Maola & Kane, 1976). However, the consensus is that CACGS are best used to supplement and enhance, rather than replace, the interpersonal career counseling process (Maze & Perlmutter, 1983). Harris (1971) notes that guidance programs should strive to achieve an optimum blend of human and machine to avoid the overreliance upon either counselors or computers. Similarly, Wrenn (1970) expresses fear for the dangers of both nonuse and overuse of computers.

Johnson (1983) has identified circumstances in which counselor intervention is essential when individuals use a

computer-based guidance system: (a) When the computer program raises anxieties, (b) When the user has difficulties or concerns regarding computer technology, (c) When the user regards the computer as an authority, and (d) When debriefing the user after computer use to correct misunderstandings.

Harris-Bowlsbey (1983) has listed the specific capabilities that computerized systems offer in meeting career guidance needs as: (a) Arousing career awareness of the need to plan, (b) Providing a broad awareness of alternatives without the screening of options based on non-relevant client characteristics, (c) Teaching a process of decision making, (d) Providing up-to-date and easily accessible banks of information, and (e) Providing systematic treatment with individualization.

Although the systems vary widely in terms of purpose, audience, and content, all appear to be directed toward persons in the exploratory life stage (Myers, 1978). Myers claims that all CACGS address the following three realms of user awareness: (a) The realm of self in which users are encouraged to consider a variety of data about their own characteristics, (b) The realm of opportunity in which users are permitted to manipulate information about courses, majors, schools, jobs and positions, and (c) The realm of prediction in which users are guided in projecting their selves, as they now see them, into some selected opportunity. Accordingly, he claims that the three

questions to be answered by the user are, respectively: "Who am I?," "What is there that I might do in the future?," and "What are my chances of doing that thing satisfyingly and satisfactorily?" (p. 53).

Myers claims that CACGS facilitate career development by (a) teaching that decision making is a rational process, (b) providing information about occupational opportunities, (c) increasing self-awareness; and (d) providing and encouraging exploratory activities.

The content and format of the numerous systems are varied, but commonly include one or more of the following components (Maze and Cummings, 1982): personal review and assessment (some using vocational inventories such as the Strong-Campbell Interest Inventory), decision making (identifying options, gathering information, assessing desirability of options, assessing risks, selecting goals), planning (assessing needed skills, identifying training opportunities, identifying resources for job openings, outlining plans), and implementation.

Several means of classifying CACGS have been proposed. Rayman and Bowlsbey (1977) have used a three generation classification system of computer systems. The first generation consists of batch information storage and retrieval systems. In this type of system, the user completes a questionnaire on which the desired characteristics of a school or occupation are indicated. The questionnaire, along with many others, is sent to a

central location to be "batch processed." A print-out is then returned to the user, listing occupations or schools that possess the combination of characteristics desired by the student. Maze and Cummings (1982) contend that such batch-process instruments do not qualify as CACGS because they fail to allow clients to directly interact with the computer and to change responses after observing their impact on the occupational selection process. However, Clyde (1979) reports that such a batch-process system, despite its inability to directly communicate with users and provide immediate feedback, "assists individuals in the decision-making process by using a computer to search large data files and identify options with predetermined characteristics" (p. 8).

Second generation systems are described by Rayman and Bowlsbey (1977) as on-line information storage and retrieval systems (examples include Educational and Career Exploration System, Guidance Information System, and Oregon Career Information System). Such systems allow the user to be in direct communication (on-line) with the computer by means of a phone line or cable and terminal devices, and offer user-computer interaction based on both the users' responses and the computer's stored files. Users have the opportunity to alter responses and note the subsequent effect on the computer-supplied information.

Third generation systems are on-line information systems that deliver guidance content beyond career

information (examples include DISCOVER and the System of Interactive Guidance and Information). In addition to providing the aforementioned on-line services, these CACGS add content and functions traditionally undertaken in one-to-one or group career counseling. For example, Rayman and Bowlsbey (1977) claim that a systematic career guidance system such as DISCOVER should include the following components: (a) Self-information, including values, interests, and competencies; (b) The systematic exploration of occupations; (c) Teaching of decision making; (d) Relationship of self-information to occupational alternatives; and (e) Informational assistance with implementation of choice. In more recent years, both the second and third generation systems have been developed for use on microcomputers. Updated information, rather than becoming available on-line, is periodically provided by the CACGS developers via newly distributed diskettes.

Clyde (1979) has developed a continuum of leading on-line systems, ranging from those that solely provide information access and retrieval (Rayman and Bowlsbey's second generation), to those that emphasize guidance and teach a decison making or valuing process (third generation). Similarly, the report of the National Vocational Guidance Association's Commission on Computer-Assisted Systems (Harris, 1971) distinguishes between indirect inquiry systems (first generation) and direct inquiry systems (second and third generation).

Penn (1981) classified the direct inquiry systems into two broad categories. Occupational Information Systems store and retrieve data as well as provide educational and occupational information. Career Guidance Systems, in addition to offering these capabilities, teach a career decision making or valuing process. Maze and Cummings (1982) note, however, that all CACGS contain both guidance and information functions.

The late 1960s saw the simultaneous development of several computerized guidance systems throughout the United States and Canada. The number of existing CACGS is difficult to estimate, as obsolete and/or unwieldy systems disappear from use, and new systems are developed and introduced. In 1974, Harris reported that approximately 30 systems became operational since 1966. A decade later, Herr and Cramer (1983) cited the same number. Several of the major systems will be briefly described, followed by a more detailed description of the System of Interactive Guidance and Information.

The Education and Career Exploration System (ECES) was developed in 1966 with funds from IBM, and has undergone several subsequent revisions. ECES consists of six subsystems (Awareness, Search, Explore, Experience, Plan, and Placement) which allow students to consider their own educationally and vocationally relevant characteristics, obtain career related information, learn decision-making and employability skills, and receive career placement

assistance. This system is still in use in the Genesee Intermediate School District in Flint, Michigan.

The Computerized Vocational Information System (CVIS), also developed in the late 1960s, was designed to provide students with a means for exploring information about themselves, and their educational and occupational interests and opportunities (Wilhelm, 1978). It provides occupational information based on Roe's (1956) Occupational Classification System. Among the content of CVIS is information about occupations, apprenticeships, local job opportunities, technical and specialized schools, two and four-year college programs, and military opportunities. The system is also capable of handling school registration and schedule changes.

Career Information System (CIS) was developed by McKinlay in 1969 at the University of Oregon under a Department of Labor grant. The purpose of the system is to provide accurate, locally-relevant career information to individuals who make personal career decisions (McKinlay & Franklin, 1975). Unlike other systems described herein, CIS emphasizes local information and is not marketed directly to schools and agencies on a nationwide basis. Instead, National CIS was developed to coordinate the development of systems on a local site-by-site basis.

The Information System for Vocational Guidance (ISVD), developed by Tiedeman and O'Hara in the late 1960s, attempted to simulate a dialogue between a career counselor

and a client. However, the system proved to be quite unwieldy and the concept too advanced for the available technology. In 1971, several of the ISVD collaborators designed an inexpensive information storage and retrieval system called Guidance Information System (GIS). According to the GIS Resource Kit (1981), the intention of the system is to "close the communication gap between the facts and those who need to know them for effective decision-making" (p. 47). Maze and Cummings (1982) report that due to its inexpensiveness, flexibility, and simplicity of use, GIS is currently used at more sites and runs on more makes of computers than any other computer-based guidance system. GIS is typically used for only 5-10 minute periods by students in need of specific career-related information on a national or local level (e.g., vocational and technical programs, financial aid, apprenticeships).

The Computerized Heuristic Occupational Information and Career Exploration System (CHOICES) was developed in Canada in 1976 by the Department of Manpower and Immigration, and is currently in use in both Canada and at least 20 states in the United States (Pinder & Fitzgerald, 1984). CHOICES possesses both an information and guidance function, having been classified by Jacobson and Grabowski (1982) as an on-line information system, and by Clyde (1979) as falling in the middle of the information-guidance continuum. The system includes a 26-page guidebook that must be completed prior to beginning the first of four access routes. Its

first component (Explore) provides career guidance, whereas the subsequent three (Specific, Compare, and Related) provide occupational information.

DISCOVER was developed by Harris-Bowlsbey in 1976 through the sponsorship of IBM. It is an eclectic system combining Holland's Self-Directed Search, American College Testing Program's "World of Work Map," Katz's work values, and Harris-Bowlsbey's concept of systematic guidance. DISCOVER is a highly comprehensive system composed of 21 modules which contain didactic material, several self-assessment inventories, and extensive information files. Versions have been designed for both the secondary school and college/adult level. DISCOVER II, released in 1982, is an abbreviated version designed for use by re-entry students and older adults.

In 1976, the National Occupational Information Coordinating Committee (NOICC) was created to facilitate interagency cooperation among the Education and Training Administration, the Bureau of Labor Statistics, the U.S. Office of Education, and the National Center for Educational Statistics. Similar committees have been created on a state-by-state basis, and in 1980 fourteen states were given grants to develop Career Information Delivery Systems (CIDS). Since that time, dozens of states and regions have adopted one of the major CACGS to form localized systems. For example, as of March, 1982, 17 localized systems have adopted CIS as their base system, 18 use GIS, four use

CHOICES, and two use DISCOVER. In addition, the Departments of Education in several states have developed or financed computerized systems which focus upon statewide and/or regional occupational information (e.g., the Colorado Career Information System, and the Michigan Occupational Information System).

In recent years a number of software packages have been introduced for use by high school and college students, students' parents, re-entry students, adults, and counselors. These microcomputer packages have been classified by Bellotto (1983) as falling into one of six groupings: self-assessment, self-assessment and career information, educational information, administrative systems, and test preparation. In addition to DISCOVER II and System of Interactive Guidance and Information (SIGI), the self-assessment and career information programs include Career Directions, Coordinated Occupational Information Network Career Search, ENCORE, Micro-Quest, Micro-Skills: Eureka Skills Inventory Self-Scoring System, Holland's Occupations Finder, Systems Design Associates' Computerized Career Assessment and Planning Progam, and Peterson's Career Planning Service.

Because of differences in the various programs' format, content, and audiences, and problems associated with the research that has been undertaken with CACGS (see following section on CACGS Research), it is difficult to make definitive statements concerning the various systems'

effectiveness and impact on users . However, tentative conclusions have been drawn which suggest the following (Cairo, 1983; Clyde, 1979; Harris, 1974; Maze & Cummings, 1982; Sampson, 1984):

1. Users acquire relevant information about educational and occupational alternatives.

2. CACGS promote a greater awareness of the need for planning.

3. CACGS increase users' concern with vocational choice, amount of exploratory behavior, and time devoted to thought and conversation about career planning.

4. Users often increase the appropriateness of their occupational preferences, making them more congruent with personal attributes.

5. Users report that CACGS are understandable, helpful in facilitating career development, and enjoyable to use.

6. Users generally report that they prefer to obtain career-related information from a computer than from other traditional sources.

7. Career counselors and parents of student users generally welcome CACGS as valuable additions to career guidance services.

System of Interactive Guidance and Information

The present study utilized SIGI as it was made available to students in four locations at Michigan State

University in East Lansing, Michigan during the Spring, Summer, and Fall quarters of 1985. SIGI was developed in 1967 by Martin Katz, a senior researcher for the Educational Testing Service. Since that time it has been field tested throughout the United States and refined with the aid of funding from the Carnegie Foundation, National Science Foundation, and Kellogg Foundation. SIGI was designed for use with two-year and four-year college students and is in use in over 150 institutions.

According to Maze and Cummings (1982), SIGI is "probably the most theoretically pure computer-assisted career guidance system" (p. 79). In a series of publications that preceded the introduction of SIGI, Katz (1963, 1966) expounded upon his "model of guidance for career decision-making," a departure from the traditional trait-and-factor theory of occupational choice. Katz contends that a humanistic process requires that individual values and manpower needs be assessed by the individual in the process of selecting an occupation. In subsequent articles, Katz (1969, 1974) presents SIGI as the working representation of this model.

According to Katz (1981), the main purposes of SIGI are "to increase students' freedom of choice, to develop their understanding of the elements involved in choice, and to improve their competence in the process of making informed and rational career decisions" (p. 3). The two major premises upon which SIGI operate are: (a) The individual

must clarify and examine his or her values as they relate to occupational choice, and (b) Having recognized the role values play, rational and structured decision making can occur.

Whereas conventional vocational counseling focuses on the domains of Interests and Aptitudes, Katz advocates the inclusion of Values as a third component. He has identified ten "Occupational Values" that are designed to help students determine those occupational rewards and satisfactions that are most important to them. They consist of High Income, Prestige, Independence, Helping Others, Security, Variety, Leadership, Leisure, Field of Interest, and Early Entry. Clarification of these values proportedly facilitates increased self and occupational knowledge, and improved decision making skills.

After logging on, and following a brief introduction, the user progresses through each of six subsystems. The VALUES subsystem has the student examine the ten occupational values and weigh the importance of each. The LOCATE subsystem has the student supply specifications for five values at a time and receiving a list of occupations that meet the specifications. The COMPARE subsystem allows the student to ask questions and receive specific information about occupations of interest. The PREDICTION subsystem has the student supply probabilities of getting various grades in key courses of programs that prepare for specific occupations. The PLANNING subsystem identifies the

steps to be taken to prepare for an occupation. The STRATEGY subsystem evaluates occupations in terms of the rewards they offer and the risks of trying to enter them. After proceeding through the six subsystems, the user is free to return to any system as he or she sees fit.

SIGI is essentially a didactic system which provides information about the client (VALUES and PREDICTION subsystems), about occupations and preparation for entry (COMPARE and PLANNING subsystems), and about the relationship between clients and occupations (LOCATE and STRATEGY subsystems). As is the case in the proposed study, the PREDICTION subsystem is often excluded from use by schools' guidance departments and counseling centers.

SIGI contains write-ups of 198 occupations covering approximately 300 titles. Because it is designed for use with college students, this number is smaller than most other CACGS geared for use with high school rather than college students. (In comparison, GIS offers 875 primary occupational listings with reference to approximately 2,500 related jobs). However, a great amount of detail is available for each occupation in the form of 28 topics such as job description, starting and average salaries, and percentage of women within the field. In contrast to some other CACGS, SIGI does not provide local labor market information, job search assistance, or military information. Also, unlike other systems, SIGI does not require interest or personality inventories, or the assessment of abilities.

CACGS Research

In Holland, Magoon, and Spokane's (1981) review of career interventions, research, and theory, only a single reference is made to CACGS despite their widespread use for over a decade. In contrast, two journals have more recently devoted entire issues to the role of computers in counseling: The Counseling Psychologist, Vol. 11, 1983; and Journal of Counseling and Development, Vol. 63, 1984. This reflects the burgeoning interest in, and implementation of CACGS among counselors, educators, and researchers. Nonetheless, after almost 20 years of use "little research has been conducted on the effects and impact of computers on career counseling" (Pyle, 1984, p. 143). Furthermore, those studies that have been undertaken provide little support for their effectiveness in helping people plan their careers or make better career decisions. Relatedly, Maze and Cummings (1982) note that it remains unclear which services computers can perform and at what point a counselor is needed. Thus, it would seem essential, as suggested by Sampson (1977), that counselors actively engage in well designed research projects to assess the value of CACGS in the process of career counseling. A review of CACGS research follows.

Numerous studies (Chapman, Katz, Norris, & Pears, 1977; Nickerson & Davis, 1983; Wolff, 1976) have used investigator or publisher created questionnaires to assess users' and/or counselors' attitudes toward particular computerized

systems. In a typical study, Savin (1978) found that 73% of 245 high school students liked using DISCOVER and 56% recommended it to their friends. Ryan, Drummond and Shannon (1980) list the following self-reports among GIS users ranging in age from 10-20: they learned a great deal about occupations (75%); they reported the system helped them confirm career plans they already had (41%); they reported GIS helped them clarify educational plans they needed to make (40%); they learned how to explore occupations (37%); and they learned more about their interests as they relate to career planning (45%). Although great differences among computer programs and client populations exist, in all such descriptive studies the majority of users have reported satisfaction and generally positive overall impressions (Clyde, 1979). The majority of extant CACGS studies appear to be solely or primarily concerned with user ratings of the systems. Cairo (1983), among others, warns that if CACGS are to represent a significant part of the delivery of counseling services, "evaluations of their impact must go beyond determining their popularity" (p. 55).

A second common dependent variable in CACGS outcome research involves the assessment of the users' level of career maturity or career development before and after exposure to one or more of the computer-based systems. Such studies (Bowlsbey, Rayman & Bryson, 1976; Devine, 1975; Drake, 1978; Traver, 1977) have relied upon such instruments as the Assessment of Career Development (ACT, 1974), Career

Development Inventory (Super, Thompson, Lindeman, Jordaan, & Myers, 1981), and Career Maturity Inventory (Crites, 1973) to measure the participants' level or stage of career development.

Kapes et al. (1985) performed a comparative evaluation of SIGI and DISCOVER. Effectiveness was measured with pre- and post- measurements on four instruments designed to assess various aspects of career development: Career Development Inventory, Career Decision Scale (Osipow, Carney, Winer, Yanico & Koschier, 1976), Survey of Career Development (Garis, 1982), and the Self-Assessment of Confidence and Progress in Educational/Career Planning (Garis, 1982), an investigator-created evaluation inventory. Although findings were complicated by simultaneous student involvement in a career planning course, the results generally indicated moderate increases in career development indices following the use of both systems, with no differences found between the two systems. As is typical of CACGS studies, predominantly positive evaluations were reported for both SIGI and DISCOVER.

Pyle and Stripling (1976) compared the adjusted Career Maturity Inventory Attitude Scale posttest scores of a control and SIGI treatment group consisting of community college students. It was found that the SIGI users' posttest scores were significantly different from those of the control group, indicating greater levels of career maturity. Using the same computer-based system and

dependent measure, Devine (1975) found no significant posttest differences between treatment and control subjects drawn from a community college population. It is noteworthy that unlike Devine, Pyle and Stripling included group orientation sessions prior to the use of each of the five subsystems, and debriefing sessions following the completion of each subsystem. This would suggest the possibility that the human intervention positively influenced the students' career maturity scores.

Cochran, Hoffman, Strand, and Warren (1977) used Harren's Vocational Decision-Making Checklist (Harren, 1966) to assess changes in decision-making stages of undergraduate SIGI users. Following three 1-hour interactions with SIGI, the treatment group, in comparison to the control group, revealed significant positive changes on pre-post measures of decision making stage related to choice of college major. No significant changes were found in pre-post decision-making stage measures related to vocational choice or to locus of control of reinforcement, as measured by the Locus of Control Scale.

Numerous studies have compared the outcomes of computer-based systems with more "traditional" career counseling approaches (English, 1974; Grisham, 1978; James & Smith, 1972; Ross, 1971; Sampson & Stripling, 1979). Reardon, Bonnell and Huddleston (1982) compared student satisfaction ratings for CHOICES and the Self-Directed Search (Holland, 1979), a paper-and-pencil career planning

guide. Seventy-five undergraduates who voluntarily completed both treatments indicated a strong preference for the computer-based system, although both programs received overall positive ratings.

Glaize and Myrick (1984) compared the effect of three career guidance interventions and a control group experience on 120 high school students. The interventions were a Vocational Exploration Group (VEG) only (Daane, 1972), DISCOVER only, VEG and DISCOVER, and a control group. The dependent measures were (a) the Career Maturity Inventory Attitude Scale, (b) the Career Decision Scale, (c) a count of the number of visits made to the school's career resource center during a two week period following the interventions, and (d) an investigator-created measure of attitudes concerning self, school, and the world of work. The Career Maturity Inventory and Career Decision Scale scores improved significantly more for each of the interventions when compared to the control group, but no inter-treatment differences were revealed. No significant differences were found among the four conditions on the latter two criterion measures.

Similarly, Garis (1982) compared the Career Development Inventory gain scores of a DISCOVER-only, Individual Counseling-only, Individual Counseling and DISCOVER, and a wait-list control group. The results, which typify career counseling outcome research in general (Fretz, 1981), revealed that all treatment groups scored significantly

higher on the questionnaire than did the control group, with no significant differences among treatment groups. In contrast, Maola and Kane's (1976) high school student CVIS users achieved significantly greater gains on Assessment of Career Development scores than did both non-CACGS career counselees and control group members.

Risser and Tulley (1977) randomly assigned college students to one of two groups: SIGI plus traditional testing-oriented counseling, and traditional career counseling and testing. The results, based on counselor ratings, showed that the group provided with the use of SIGI scored significantly higher on various indices of career development.

In a study involving non-high school graduates, Penn (1981) examined the differential effects of the use of DISCOVER alone or in conjunction with one of three other career exploration strategies. The three additional interventions were (a) the presentation of "lifestyle" films, (b) an interview procedure entitled "Psychosocial Visit Exploration," and (c) "structured traditional career counseling" which included administration and interpretation of the Career Assessment Inventory and the use of the Occupational Outlook Handbook and the Dictionary of Occupational Titles. DISCOVER was offered alone and in conjunction with the first and second strategies. Participants in the third strategy were considered a control group. Using the Assessment of Career Development and the

Assessment of Career Decision Making (Harren, in press) the results showed no differences between the treatments for the following vocationally-related dependent variables: career planning knowledge, decision making skills, career decision making style, career planning involvement, and knowledge regarding occupational information. However, the author discovered several age related differences. For example, DISCOVER was more effective in providing career planning knowledge to older clients (22-24 years old) when used in conjunction with a psychosocial career exploration strategy than was the traditional career counseling program.

Several studies, including Glaize and Myrick (1984) and Kapes et al. (1985) described above, have used measures of career decidedness in addition to indices of career development to determine the effectiveness of CACGS. Using the Career Decision Scale and the Assessment of Career Decision Making (Occupational Decision Making Subscale only) as pre- and posttest measures with undergraduate and graduate volunteers, Pinder and Fitzgerald (1984) found significant differences between a CHOICE and control group's adjusted posttest indecision scores on both scales.

Such studies that compare the effectiveness of career interventions such as "traditional counseling," "group counseling," or "individual counseling" have been criticized for their failure to describe the nature of the interventions under investigation (Fretz, 1981). For example "traditional career counseling" may or may not

include the use of interest and aptitude inventories, the teaching of decision making skills, a discussion of personal values, etc. The approach may be highly eclectic, didactic, client-centered, cognitive-behavioral, structured or unstructured. Similarly, although the internal structure of programs such as SIGI are standardized, investigators often fail to consider the potential contributory impact of such factors as orientation and debriefing sessions, the absence or presence of counselors or support personnel, the required or recommended use of paper-and-pencil CACGS-related exercises or support material, and the amount of time spent on the system.

Many additional weaknesses of CACGS research have been cited in the literature (Cairo, 1983; Clyde, 1979; Garis, 1982; Snipes & McDaniels, 1981), including:

1. Broad conclusions have been reached on the basis of user opinions measured by investigator-created questionnaires which lack proven validity, are reactive, and/or subjective.

2. The lack of congruence between criterion measures and the objectives of the system under evaluation.

3. Overreliance upon user evaluations and measures of vocational maturity.

4. A tendency to ignore the prerequisite skills needed by CACGS users.

5. The absence of subject randomization.

6. A paucity of longitudinal studies.

7. Failure to include behavioral measures such as time spent on the system, time spent on particular components of the system, or subsequent visits to career resource libraries.

An additional commonly cited shortcoming of career counseling and CACGS research that is particularly germane to the present study involves the failure to take into consideration client variables that may influence the effectiveness of the intervention. A study by Melhus, Hershenson, and Vermillion (1973) is apparently only one of two CACGS investigations devoted to matching treatment methods with client variables. The investigators rated high school students on "readiness for counseling," based on standardized educational and "personal coping" ability tests. High readiness and low readiness high school sophomores were randomly assigned to either a computer-based system (CVIS), or a traditional individual counseling treatment. Effectiveness of the interventions was measured by progress toward crystallization of vocational goals using the Occupational Plans Questionnaire (Hershenson, 1967). Results indicated that high readiness students progressed equally well with both treatments. The low-readiness students made progress in both groups, but showed greater progress in the traditional individual counseling group. The authors suggest that counselors should spend a greater proportion of their time with low readiness students.

In the second such CACGS study, Marin (1984) examined

the differential effectiveness of a computer-only (DISCOVER II) and computer-plus-counselor career guidance intervention. The interaction between these procedures and subject decision making styles (rational, intuitive, dependent) was also examined. Using pre- and posttest data from the Assessment of Career Decision Making (Occupational Subscale), Career Decision Scale, and Occupational Alternatives Questions, the investigator concluded that: (a) the computer-plus-counselor intervention was more effective than the computer-only intervention, and (b) individual decision making styles did not affect progress by interacting with the intervention method.

In a relevant study not specifically involved with CACGS, Coovert and Goldstein (1980) found that a group of undergraduates with internal locus of control scores had more favorable attitudes toward computers than external locus of control scorers. Regarding client-CACGS interaction factors, it has been reported that deaf students struggle with the vocabulary on SIGI (Slusher and White, 1978), and the same program may be deficient in areas of concern to the adult learner (Adams, 1978; Diamond, 1975).

Lacking empirical evidence to support their contentions, several authors have raised thought-provoking questions about the advisability and appropriateness of CACGS use with various other user populations. For example, Haring-Hidore (1984) claims that female students, minority students, and low achievers are likely nonusers of CACGS.

Walz (1984) suggests that clients with linear cognitive styles may find the computer less appealing than those with inferential thinking and learning styles. Walz does not explain the rationale for this supposition, the reverse of which would seem more plausible. He also contends that experience with computer games may influence one's response to CACGS. Such claims suggest the importance of undertaking research aimed at determining the "goodness of fit" between CACGS and various client populations. The following section cites examples of, and describes in more detail the rationale behind such a client-treatment matching approach in career counseling and CACGS research.

Attribute-Treatment Interaction

Educational and psychological experimentation has traditionally focused on the differential influence of one or more independent variables such as teaching methods or therapeutic interventions, on one or more dependent variables. In recent years a line of experimentation has expanded upon this model, giving equal consideration to a second form of independent variable, learner or client characteristics. This line of study was originally called aptitude-treatment interaction research because it dealt with the varying aptitudes of students (Borg & Gall, 1983). It has more recently been labelled attribute-treatment interaction research because its focus centers upon a wider

range of learner and client characteristics. Such studies generally consist of two types of independent variables: the first a treatment or teaching method; the second a student or client characteristic such as a personality dimension, demographic classification, or level of academic achievement. Attribute-treatment interaction research thus gives equal consideration to both the client and treatment characteristics that may influence counseling outcomes.

In 1964, Colby warned against the "patient uniformity assumption" (p. 350), wherein individual traits of research subjects are ignored or overlooked by psychotherapy investigators. Hunt (1977) states that "the better we are able to answer the question 'What approach produces what effects with what kind of client?'... the more we will understand about the counseling-client process" (p. 12). Hunt has outlined a differential treatment model for use with drug abusers that exemplifies this attribute-treatment interaction approach. His model adopts the formula provided by Lewin (1935), B = f (P, E), or Behavior is a function of the Person and the Environment. It states that in terms of outcomes (B) the purpose of this differential treatment model is to coordinate client characteristics (P) with treatment approaches (E). Or otherwise stated, E : P > B, a specific counseling approach used with a specific person leads to a particular result. In this "BPE" drug abuse program, the treatment assignment, rather than being based solely on the type of drug being abused or pattern of abuse,

takes into consideration client characteristics (individual differences) representative of some system of personality organization, developmental stage, or other psychological consideration.

Cronbach and Snow (1977) reviewed all of the extant attribute-treatment interaction studies in educational instruction and concluded that students with high-average as compared to low-average intelligence levels have been shown to benefit significantly more from less structured curricula, and from roughly structured computer assisted instructions. Students with a high need for achievement and low amount of defensiveness benefited most from teaching conditions that provided more freedom and challenge, and treatments that required the learner to supply a good deal of the structure and task specification. Defensive persons were found to do better when instructions placed less demand on them for structuring their learning.

Numerous psychotherapy outcome studies have found that such client characteristics as level of anxiety (Brown, 1969), degree of dependence (Gilbreath, 1967), locus of control (Abramowitz, Abramowitz, & Roback, 1974), intelligence (Rogers, 1954), level of achievement (Schaefer, 1976), self-confidence (Wachowiak, 1973) and sex (Thoresen, Krumboltz, & Varenhorst, 1967) differentially influence the results of specific interventions. In his review of research on client variables in psychotherapy, Garfield (1971) noted that clients' degrees of defensiveness, level

of motivation, expectations from therapy, degrees of discomfort, and socioeconomic status have been shown to influence treatment outcome.

The therapist-patient matching model is exemplified in the pioneering work of Whitehorn and Betz (1960) who differentiated therapists whose schizophrenic patients improved most from therapists whose schizophrenic patients improved least. These researchers, labelling the former therapists "As," and the latter, "Bs," stimulated numerous subsequent investigations into this A-B interaction hypothesis. Although the results of numerous studies are highly equivocal, such research has suggested that A-type therapists, as derived from scores on the Strong Vocational Interest Blank, may work better with schizophrenics, and B-type therapists with neurotics.

In 1968, Hebert investigated the effects of similarity and dissimilarity between selected personality needs of vocational clients and counselors on the counseling relationship. Nineteen counselors and 108 clients were administered the Edwards Personal Preference Schedule (EPPS) prior to counseling, and the Communication Rating Scale at the conclusion of the last (second) interview. Results indicated the following: (a) significant interaction between client sex, counselor sex, and degree of similarity on the EPPS, (b) male clients gave significantly higher ratings to male counselors than did female clients, (c) male clients tended to agree with their counselors, regardless of

counselor's sex, on the rating of the relationship, to a greater extent than did female clients. Such a study suggests that client and counselor traits may interact to influence the therapeutic outcome.

Butcher and Hebert (1985) investigated the influence of locus of control similarity between counselor and client in a matched case study procedure. Two university clients were selected for participation based on matching by sex (male), and Rotter IE Scale scores (one highly similar to the counselor, one highly dissimilar). Through time-series IE self-recordings, and Counselor Comfort, Counseling Climate, Client Satisfaction, and Counseling Evaluation Inventory ratings by the clients, counselors, and an expert rater, levels of counseling effectiveness were determined. In general, it was found that the counselor-client intervention matched according to IE scale scores was significantly more effective than the client-counselor mismatched intervention. Their findings led the authors to conclude that they had provided valuable additional evidence which suggests that "client and therapist variables account for the largest percentage of variability in clinical outcomes" (p. 108).

The majority of attribute-treatment interaction studies have matched clients and therapists, rather than clients and treatment methods. The distinction between "therapist" and "treatment method" is an important one for several reasons. First, therapists' treatment approaches are often eclectic and/or non-aligned with any single therapeutic orientation.

Secondly, the actual therapeutic procedure employed by a therapist often bears little or no resemblance to his/her stated therapeutic orientation (Argyris, 1976). For example, a series of studies by Fiedler (1950, 1951) established that those who adhere to a particular therapeutic theory can not be regarded as interchangeable units. Finally, therapist-client matching studies often focus upon the former's personal traits, therapeutic expectations, counseling experience, or demographic characteristics, while ignoring or minimizing treatment method.

Client-treatment method interaction studies have appeared with regularity in the personal/social psychotherapy literature. For example, Abramowitz, Abramowitz, Roback, and Jackson (1974), and Best (1975) examined the effects of tailoring treatment procedures to clients' internal-external beliefs (as measured by Rotter's 1966 Locus of Control Scale) so as to facilitate abstinence from smoking. Abramowitz et al. used directive group therapy for externals, and nondirective therapy for internals. Best exposed internals to stimulus satiation aversion procedures, whereas externals were encouraged to conduct situational analyses of environmental cues that influence their smoking. Client-treatment interaction effects were significant in both studies.

Meichenbaum, Gilmore, and Fedoravicius (1971) examined the comparative efficiency of desensitization,

rational-emotive therapy, and the two combined in group therapy with speech-anxious clients. The researchers found that the two treatment modalities were equivalent, but superior to control procedures. Post hoc analysis revealed a client-treatment interaction when participants were subdivided according to the specificity or generality of their anxiety. Specifically, desensitization yielded better results with the subgroup with anxiety specific to speech situations, whereas the rational-emotive therapy yielded better results with the group experiencing generalized interpersonal anxiety.

Similarly, DiLoreto (1971) examined the comparative effectiveness of three treatment modalities on introverted and extraverted undergraduates suffering from interpersonal and general anxiety. While participants in all three treatment groups showed more improvement than controls, systematic desensitization appeared equally effective with introverts and extraverts, whereas rational-emotive therapy favored introverts, and client-centered therapy favored extraverts.

There have apparently been far fewer empirical examinations of the interaction between clients and treatment methods in the career counseling literature. It is not uncommon to see a comparative career counseling study involving the ambiguous label "traditional vocational counseling." Such descriptive vagueness serves little value to the research consumer interested in the comparable worth

of counseling practices. In addition, it has been suggested that the failure of career counseling research to find differential effects among various treatment approaches may be due to the investigators' failure to include clients' individual differences as a major independent variable (Kivlighan, Hageseth, Tipton, & McGovern, 1981). Fretz (1981) has suggested that career counseling studies which find client variables to have a significant effect on outcomes may be offering a type of treatment that is interactive with a given attribute, whereas those studies without effects may be providing treatments that are not interactive with client characteristics. Numerous authors (Krumboltz, 1966; Super & Hall, 1978; Takai & Holland, 1979) have noted the need for career counseling research that takes into consideration how individual differences interact with treatments.

Rubinton (1980), taking into account both client and treatment characteristics, predicted correctly that rational decision makers would do best with a "rational" career intervention, whereas intuitive decision makers would do best with a more "intuitive" approach. Like many such career counseling outcome studies, she relied upon pre-post measures of career maturity and certainty of vocational choice as the determinants of intervention effectiveness.

Johnson, Smither, and Holland (1981) evaluated two college career development seminars "to determine what kind of vocational interventions were helping what kind of

people" (p. 180). Indices of vocational decidedness and identity were derived using the Vocational Decision-Making Difficulty Scale (Holland & Holland, 1977) and My Vocational Situation (Holland, Daiger, & Power, 1980). The criterion variables consisted of treatment ratings for numerous seminar experiences such as the Vocational Exploration and Insight Kit, the Self-Directed Search, the Occupational Handbook, and talking to employed people about their jobs and careers. Although an overall main effect of all treatments on raising students' level of vocational decidedness and identity was found, no interactions between characteristics of students and treatment ratings were revealed. These results were echoed by Henkels, Spokane, and Hoffman (1981) who found that vocational identity had no significant relationship to students' preferences for receiving interest inventory results by profile only, by audiotape, or by direct contact with a counselor.

Warner and Jepsen (1979) designed an experiment to study the interaction effects of conceptual level and group counseling format on adolescents' career decision-making behavior. It was predicted that students low on conceptual complexity and interpersonal maturity (low CL) would profit from a highly structured treatment environment, and that high CL students would benefit more from low structure. No significant interaction or main effects were obtained for attitudes toward career decisions and planning activity. It was found that group format was related to students "choice

basis complexity" (the differentiation of factors considered in making a career decision) for the high CL group. The interaction, however, was in the opposite direction of that predicted, which the authors attribute to flaws in the research design.

Power, Holland, Daiger, and Takai (1979) examined the effects of the Self-Directed Search as related to 493 high school students' sex, expectation for treatment, vocational identity, and vocational decision-making difficulties. Outcome measures were the number of occupations being considered at posttest, the variety of options, and the score on a revised Treatment Evaluation Scale (Zener & Schnuelle, 1976). Results revealed that students generally evaluated the Self-Directed Search favorably, regardless of their level of treatment expectation. Also, students with low identity scores and high levels of decision-making difficulties tended to have the lowest Self-Directed Search ratings. Those who were high on identity and low on decision-making difficulties tended to rate the treatment more positively.

Sampson (1984) contends that the interaction between various user characteristics and CACGS' effectiveness is an area in need of investigation. In his review of CACGS outcome research, Cairo (1983) states:

> In most of the evaluations... there is the implicit assumption that all users have the same needs. Thus all users are lumped together into one experimental group and compared with nonusers on all the same criterion variables... There is also a question regarding what type of user is most likely to benefit from using a computer-assisted system... but overall this issue remains relatively unexplored. (p.58)

As discussed in the CACGS Research section, the studies by Marin (1984) and Melhus et al. (1973) represent the only two CACGS studies concerned with the interaction between client and treatment characteristics. Berzins (1977), referring to psychotherapy process and outcome studies in general, criticized the relatively few extant client-treatment matching studies on the grounds that they often fail to demonstrate true differences among treatment groups, and often fail to account for possible interaction effects between counselors' personalities and the treatment methods used. The present study attempts to avoid the first shortcoming by employing Holland's General Occupational themes to differentiate among SIGI users. The second shortcoming is not relevant due to the absence of counselor intervention.

Interventions such as SIGI differ markedly from the treatments discussed in the aforementioned client-treatment method interaction studies in their nonreliance upon therapists. As previously noted, therapeutic procedures often differ from the practitioner's stated orientation. However, a CACGS is a generally standardized procedure unaffected by such potentially intervening factors as therapists' expectations, personal traits, theoretical orientation, age, sex, race, experience, etc. It is true that the manner in which a CACGS is offered to a clent may influence its effectiveness (e.g., with a pre-treatment orientation session or post-treatment debriefing; in

conjunction with a discussion group or career planning class; used partially or in its entirety; made available in a library, career center, or college placement office, etc.). Nonetheless, the intervention itself varies little among users, and provides a generally well defined "treatment method" for investigation. The following section consists of a description of Holland's theory and research incorporating his constructs.

Holland's Theory

Holland's (1966) theory of vocational typologies appears to be an outgrowth of Lewin's (1936) dictum that "behavior is a function of personality and environment" (p. 57). To Holland, the choice of a vocation is, in part, an expression of an individual's personality. Vocational interests are viewed as a product of one's life history, rather than as an isolated entity.

Holland contends that people can be characterized by their resemblance to one or more of six personality types. A "type" represents a cluster of personal attributes which may be used to measure the person (Walsh, 1973). According to Holland, people generally possess characteristics of all six types (paraphrased below) with one or two predominating orientations.

Artistic people have a high need for original and individualistic expression. They tend to be asocial,

intraceptive, emotional and more conventionally feminine than masculine. These people dislike structure, and prize aesthetics.

Conventional people prefer structure and order in verbal, numerical, and behavioral activities. They tend to be concerned with rules and regulations, and identify strongly with power and status.

Enterprising individuals seek situations where being popular, verbally assertive, gregarious, and taking leadership roles are important. They strive to acquire power and status, while avoiding analytic and more individually oriented endeavors.

Investigative people tend to have creative, analytic, and intellectual interests, and prefer to think through rather than act out problems. They often report themselves as being scholarly, precise, inventive, confident, and lacking leadership qualities.

Realistic individuals are characterized by aggressive behavior, mechanical skill, practical mindedness, and conventional masculinity. They prefer to act out problems, to avoid interpersonal tasks, and to seek concrete rather than abstract problem situations.

Social people enjoy understanding and helping others. They prefer settings where they can help, train or inform others. Social individuals usually value socially and ethically oriented issues and activities, while avoiding mechanical, highly ordered, or scientific ones.

A related assumption is that the environments in which people work may be characterized by their resemblance to one or more environments. Thus, for each personality type there is a logically related environment. For example, the Enterprising environment is characterized by tasks requiring verbal responses meant to influence people.

Holland claims that the degree of person-environment congruence influences such outcomes as vocational stability and achievement, personal stability, creative performance, and personal development. The theory contends that Conventional types search out and experience more satisfaction within Conventional environments, and so forth among the other five classifications. The present study attempts to incorporate Holland's theory of congruence with the attribute-treatment interaction model. This approach tests Holland's contention that "the classifiction can be used to form groups and subgroups to interpret the results of experiments or surveys or to simplify the individual-differences treatment problem" (1985, p. 147). It is predicted that the degree of congruence between personality type and treatment will influence the effectiveness of the computerized career guidance intervention.

For many years researchers and practitioners have attempted to apply Holland's theory for the purpose of matching people and jobs. More recently, researchers have attempted to employ this trait-factor approach for the

purpose of matching clients and treatments. According to Holland (1966), "The formulations for the types imply that people of different types have different reactions to psychotherapy.... The formulations also imply that different kinds of treatment are suitable for different types of people" (pp. 92-93). Although CACGS do not represent a form of psychotherapy per se, it is reasonable to assume that Holland's contentions are equally applicable to the career guidance provided by computerized systems.

Studies using Holland's six personality types to measure client-counselor and client-treatment interactions (Jones, 1969; MacDonald, 1984; Whitney and Whittlesey, 1972) have had mixed results. Cox and Thoreson (1977) investigated the effect of congruent Holland personality environments between clients seeking career counseling and career counselors. One hundred and forty-four college students selected among three career counselors scripted to represent one Holland personality type. Results indicated no clear-cut selection of similar versus dissimilar counselors, but a predominant selection of the Holland Social-type counselor.

In contrast to the Cox and Thoreson investigation, Kivlighan et al.'s (1981) study supports the notion of client-treatment matching according to Holland's typologies. Forty undergraduate vocational counseling clients were categorized as either more people oriented (Enterprising and Social types) or more task oriented (Investigative and

Realistic types) according to their Vocational Preference Inventory (VPI) scores. The participants were then assigned to one of two groups; one emphasizing vocational counseling through numerous interactions with participants (people oriented), and the other emphasizing individual problem solving (task oriented). Both groups met twice. Analyses of covariance on subject responses to the Career Maturity Inventory indicated that participants matched with treatments similar to the participants' orientations demonstrated greater career maturity, engaged in more career information seeking behavior, and enjoyed the group sessions more.

With the exception of the present investigation, and a CACGS study currently being undertaken by Kirschner (personal communication, December 18, 1985), the Kivlighan et al. investigation apparently represents the only study employing this people and task orientation classification derived from Holland's General Occupational Themes. In addition, no accounts of attribute-treatment interaction studies involving both CACGS and Holland's typologies have appeared in the literature to date. However, Bruch (1978), in discussing the matching of male clients and career interventions according to Holland's types, states:

> The use of direct counseling approaches employing simple instructions, examples and guided practice seems desirable for R, C, and IR type clients because of their preference for structured activities and action rather than symbolic-introspective activities.... The use of reading materials and "apparatus" such as programmed learning or computer assisted materials... may appeal to this client's desire for structure, manipulation of

> materials, and more impersonal approaches to problem solving.... Programs such as the System of Interactive Guidance Information (sic)... are illustrations of approaches suited to individuals with these personality types. (pp. 30-31)

The present study represents a modified test of Bruch's contention that certain personality types, as conceptualized by Holland, will be more amenable to, and benefit more from a CACGS intervention than others. Based on the six aforementioned personality types, clients have been categorized as either people oriented or task oriented. As in the Kivlighan et al. study, people oriented participants are those whose highest Vocational Preference Inventory scores are either Social or Enterprising. Task oriented participants are those who score highest on either the Investigative, Realistic, or Conventional scales. Kivlighan et al. did not include the Conventional type in their task oriented classification. However, that study did not involve CACGS, and the inclusion of the Conventional type among those who would seemingly be amenable to CACGS use, would appear warranted.

Bruch, quoted above, proposed that R, IR and C types would be likely CACGS users. According to Holland (1985), Conventional types prefer activities that entail the ordered, systematic manipulation of data. They are disposed toward the use of "data processing machines" in the attainment of economic and organizational goals. According to Campbell and Hansen (1981) Conventional individuals are effective at well-structured tasks, and avoid ambiguous

situations and problems involving interpersonal relationships. They tend to describe themselves as efficient, orderly, and practical. All of these characteristics seem congruent with the tasks involved in SIGI.

Osipow (1973) and Walsh (1973) have noted that Investigative and Realistic individuals prefer an environment in which there is little contact with others. Holland (1973), in noting the traits shared by Investigative and Realistic individuals, included "unsociability, (and) an orientation toward things rather than people" (p. 21). In contrast, he reported that of the six types, the Social and Enterprising persons rely most on other people for their vocational information. Vierstein (1972) found that the Social and Enterprising individuals were the most involved with people. Similarly, Osipow (1973) and Walsh (1973) have emphasized the interpersonally oriented learning environment of the Social and Enterprising types. It is noteworthy that of the fifteen possible two code pairings, SE and RI are the second and third most highly correlated; .54 and .46, respectively (Holland, Whitney, Cole, & Richards, 1969). Thus it is logical that a great many similarities between S and E's, and I and R's have been cited in the literature.

Holland (1985) claimed that people with different personality patterns respond to teaching methods according to the formulations for the types. Relatedly, in the

present study it is hypothesized that SIGI will be more effective with task oriented (I,C,R) than people oriented (S,E) individuals for the following reasons:

1. SIGI involves the clarification of personal values, and instruction in the decision-making process. Both involve individual, rather than socially interactive, problem solving and self-exploratory processes. Such procedures are more likely to be favorably responded to by the Investigative and Realistic individuals, who rely on self-examination in their vocational decision making (Osipow, 1973; Walsh, 1973).

2. SIGI is undertaken in the absence of other persons, entails the use of a computer keyboard, monitor and printouts, and involves the printed rather than spoken word. The Social and Enterprising individuals will likely be less amenable to such a mechanistic and nonsocial approach.

3. SIGI's VALUES and STRATEGY subsystems involve quantified weightings of values and ratings of occupations, respectively. Such an approach is more likely to appeal to the structured and analytical disposition of the Conventional, Investigative and Realistic individuals.

4. There is evidence to suggest that Conventional, Investigative and Realistic persons are more likely than Social and Enterprising individuals to have an affinity for computer use. For example, the following occupations and matching code types are used in the Strong-Campbell Interest Inventory: Computer programmer (IRC); and Computer operator

(IC and C). The code type for each occupation was derived either by testing people in that occupation to determine their highest codes, or by asking people of known code types which occupations they liked.

A review of existing studies employing Holland's General Occupational Themes, and the VPI in particular, reveals no consensus regarding the manner in which individuals should be classified, nor the manner in which data should be analyzed. Holland (1985) claims that the "flexibility of the classification makes it possible to cope with both representative and unrepresentative populations" (p. 147). He further recommends the expansion or contraction of classifications in order to deal with skewed distributions of data. He cites this as a necessity due to the skewed distribution of types among various groups. For example, Nafziger, Holland, Helms, and McPartland (1972) had to analyze their data in such a manner to accomodate the following skewed distribution of young people: R=82%, I=5%, A=2%, S=2%, E=6%, and C=4%.

Because of the nature of the hypotheses under investigation in the present study, and the profiles of the participants, the classifications derived from the VPI were categorized as follows: All participants with high point codes of C, I, and R were labeled "task oriented," those with S and E primary codes are "people oriented." Participants whose primary codes were A, were categorized as task or people oriented, according to their secondary codes.

Six remaining participants who could not be classified according to this procedure were excluded from analysis. Ten of the people oriented participants whose primary and secondary codes were S or E, in either order, were subclassified and separately analyzed as "Pure SE's." The breakdown of participants according to their Holland codes appears in Table 2 of the Results section.

It bears mentioning that a construct bearing resemblance to this task and people orientation classification has received considerable attention in the industrial/organizational psychology literature. In his attempt to determine optimal leadership characteristics, Fiedler (1964) described two styles of interaction: a task (or production) orientation, and a relationship (or employee) orientation. The former is said to primarily satisfy "the leader's need to gain satisfaction from performing the task," whereas the latter "is primarily oriented toward attaining a position of prominence and toward achieving good interpersonal relations" (Fiedler, 1967, p. 13). Numerous studies have provided evidence suggesting that the two styles are differentially effective according to the nature of the organizational structure and climate.

In 1961, Bass created the Orientation Inventory, a 27 item self-report instrument that generates three scores: self-orientation, interaction-orientation, and task-orientation. Like Kivlighan et al.'s people and task

orientations, Bass's personality types relate to the respondents' preference for and concern with others versus self, and social versus asocial activities. Because the Orientation Inventory possesses poor and unproven psychometric properties (Bouchard, 1978), has generated relatively little scientific attention, and is not commonly used among career counselors and researchers, it was deemed inappropriate for use in the present study. Instead, Holland's VPI has been used to determine the participants' orientation toward people or tasks. A description and rationale for the use of the VPI appears in the Methodology section.

Research Hypotheses

A consideration of the literature relevant to CACGS, attribute-treatment interaction studies, and Holland's typologies led to the following hypotheses. Hypotheses 1, 2, and 3 represent the major hypotheses to be tested in the present study. Hypotheses 4, 5, and 6 serve to determine the relationship between the dependent variables under investigation.

Hypothesis 1: Task oriented participants will evaluate SIGI more favorably than people oriented participants.

Hypothesis 2: Task oriented participants will spend more time on SIGI than people oriented participants.

Hypothesis 3: Task oriented participants will be more career decisive following the use of SIGI than people oriented participants.

Hypothesis 4: A positive relationship will exist between time spent on SIGI and SIGI evaluations.

Hypothesis 5: A positive relationship will exist between time spent on SIGI and career decisiveness following SIGI use.

Hypothesis 6: A positive relationship will exist between SIGI evaluations and career decisiveness following SIGI use.

Exploratory Issues

In addition to the above six central hypotheses, a number of additional issues have been examined. They are as follows:

1. The people oriented participants (N=44) were subclassified as "Pure SE's" (N=10) and "People-minus Pure SE's" (N=34). The former subgroup consists of those people oriented participants whose primary and secondary occupational codes are Social and Enterprising, in either order. The latter group are those people oriented participants whose primary code is Social or Enterprising, and whose secondary code is neither Social nor Enterprising; or stated otherwise, people oriented participants who are not "Pure SE's." It is expected that the "Pure SE's," will

exemplify this orientation toward people. In comparison to the people and task oriented participants, they are expected to respond least favorably to SIGI, as measured by the three dependent variables under investigation.

2. To determine if the participants' level of career decisiveness changed after exposure to SIGI, pre- and post-SIGI CDS scores were compared.

3. A test was performed to determine the internal consistency of the investigator-created SIGI Evaluation Questionnaire.

4. A further attempt was made to determine the relationship between the two levels of independent variable (task and people orientation), two additional independent variables (sex and previous use of CACGS), and the three dependent variables (time spent on SIGI, evaluation of SIGI, and career decisiveness following the use of SIGI). The purpose of this analysis is to shed light on the impact of additional independent variables on the use of SIGI.

5. An attempt was made to determine if differences exist between those participants who were and were not concurrently seeing a career counselor. These participants' mean scores on the three dependent variables were compared. In addition, a test was performed to determine if any relationship exists between these two categories of participants and the two orientation (task and people) classifications.

6. A non-statistical comparison was made between the 69

research participants, 35 students who did not complete the required forms, and a comparison group of 639 Michigan State University SIGI users, on eight variables (sex, age, race, college class, previous CACGS use, orientation, concurrent career counselor contact, and pre-SIGI CDS scores). This was to determine if (a) noncompletion represented a confounding variable in the present study, and (b) the present study's findings can be generalized to university SIGI users in general.

7. Ten of the participants were Artistic types whose secondary codes were used to determine task or people orientation. The task and people orientation groups' dependent variable mean scores were compared when the Artistic codes are both included and excluded from analysis. This comparison was performed to determine the potential confounding nature of this heretofore untested procedure. The small number of Artistic types (10) made statistical analysis inadvisable.

CHAPTER III

METHODOLOGY

Research Design

The present study is a "correlational design" (Campbell & Stanley, 1966). According to Borg and Gall (1983) the first three hypotheses are "confirmatory" in that they are directed at providing empirical support for theoretically based hypotheses. The additional three hypotheses, which are aimed at studying the relationship between heretofore uninvestigated variables, are "exploratory" in nature.

The central (dichotomous) independent variable is orientation (task or people). Two secondary (dichotomous) independent variables are sex (female or male), and previous use of SIGI (yes or no). The three dependent variables are evaluation of SIGI (as measured by the SIGI Evaluation Questionnaire), time spent using SIGI, and career decisiveness (as measured by the Career Decision Scale).

Participants

Sixty-nine undergraduate Michigan State University students participated in the present study during the 1985, Spring, Summer and Fall quarters. Forty-nine (71%) were female, 20 (29%) were male. The students ranged in age from 17 to 38. (Excluding the single 38 year-old, the range was 17 to 23).

The mean age was 19 years, 6 months. The distribution of participants by college class was follows: 27 freshmen (39%), 28 sophomores (41%), 7 juniors (10%), and 5 seniors (7%). Two students failed to report their age and class standing. Because of the preponderance of underclasspersons and Caucasians, the data were not separately analyzed by age, class standing, nor race. (See Table 6 for a full demographic breakdown).

Initial efforts at obtaining treatment and control volunteers for the present study proved unsuccessful, resulting in thirteen participants, only two of whom completed the necessary forms to qualify for inclusion in the study. The explanation for this investigator's inability tp procure participants, despite extensive advertisement and recruitment efforts, seems rather apparent. Students at Michigan State University, at the time the study occurred, had free access to eight SIGI terminals across campus. There was no personal advantage to their participation in the study, nor any reason for those randomly placed in the control group condition to agree to delay their use of SIGI for several weeks.

Subsequent participants consisted of undergraduates who either independently requested the use of SIGI, or were referred to SIGI by career counselors, residence hall personnel, or academic advisors. Although referral sources were not formally ascertained, a random inquiry of participants suggested that the great majority

were self-referred, having heard of SIGI from friends or classmates at CSU.

It is noteworthy that 35 students who completed the Consent Form failed to provide ample data to warrant inclusion in the study. Of these participants, 33 completed the SIGI User Information Form, 30 completed the VPI, and 26 completed the pre-SIGI CDS. Several of these students failed to complete one or more of these inventories in their entirety. Three of these students completed the post-SIGI CDS, and only two completed the SIGI Evaluation Questionnaire, which provided information regarding two of the study's three dependent variables (time usage and SIGI ratings). Several plausible explanations for such noncompletion are possible. It is likely that many students indicated to the receptionists that they intended to reschedule fr SIGI and then failed to do so; or rescheduled for a subsequent appointment and then did not return. It is also likely that many students left the ite without checking in with the receptionist as instructed prior to SIGI se. Also, the receptionists may have failed to provide the post-SIGI materials to students who indicated tha they had completed the program. Finally, it is known that some students received the post-SIGI forms, but failed to provide any or all of the necessary information.

Because of the potential confounding effects of such noncompletion, a non-statistical comparison has been made of the 69 participants and the 35 non-completers (see Table 6).

No obvious discrepancies appear to exist between the completers and noncompleters on the eight demographic categories for which information was available. The potential confounding effect that this incomplete data may have had on the study's findings is examined in the Discussion section. Table 6 also includes the sex, race and class standing of the approximately 639 students who used SIGI at the Counseling Center, Brody Hall, and Learning Resource Center during the Fall, 1985 and Winter, 1986 quarters at Michigan State University. Wonders Hall did not offer SIGI during these terms. Once again, a non-statistical comparison would ppear to demonstrate that this study's participants accurately represent Michigan Stae University SIGI users in general.

To further determine the generalizability of the present study, an attempt was made to compare the participants with those in similar studies involving CACGS in general, and SIGI in particular. Unfortunately, most authors fail to provide demographic information regarding their studies' participants. As in the present study, virtually all of the investigations cited in the CACGS Research section involved volunteer CACGS users, rather than students paid or required to participate. The few authors who provide the gender distribution of their undergraduate participants, reveal a female-male ratio similar to that of the present study (e.g., Coovert & Goldstein, 1980: 62% female; Reardon et al., 1982: 77% female; Kapes et al.,

1985: 69% female). Because individual differences are rarely considered in CACGS studies, breakdowns according to class standing, race, age and other demographic variables are unavailable. The fact that a large percentage of participants in the present study are underclasspersons (82%) would certainly seem typical of undergraduate career clients in general. Given these facts, it is reasonable to assume that the present study's participants are typical of CACGS users at other universities.

Setting

Participants used SIGI at one of four locations at Michigan State University during the 1985, Spring, Summer and Fall semesters. The sites were the University Counseling Center (Spring and Summer, N=17); two of its satellite offices: Wonders Hall (Spring, N=11), and Brody Hall (Spring, N=4); and the Learning Resources Center (Spring and Fall, N=37). The Counseling Center offices provide a full range of personal and vocational counseling services. The Learning Resources Center, in addition to offering SIGI, provides workshops and individual counseling on a variety of academically related areas such as study skills, time management, test taking, and word processing. Each of the locations had one SIGI station available for student use by appointment.

At the time data were being collected, no formal

written or oral pre-SIGI orientation procedures existed at any of the sites. No effort was made to account for all SIGI users' preparation for, or familiarity with, the system prior to its use. Those students referred by career counselors, residence hall personnel, or academic advisors likely received cursory descriptions of the program. It is unlikely that any such brief and informal preparation would have had significant influences on the outcomes under investigation in the present study.

At each location, use of SIGI occurred in relative isolation, with nearby technical assistance available. Although the physical settings, noise levels, and degrees of privacy differed somewhat in the four locations, each appeared quite adequate for the successful implementation of the system.

Procedures

The manner in which students used SIGI and completed the study's inventories was largely the same at all four sites. The components and format of the SIGI program itself was identical at each location. Any administrative, procedural, or environmental dissimilarities that may have existed do not appear to warrant separate analyses or exclusion from the study. Students scheduled, either in person or over the phone, an initial two-hour appointment to use SIGI. Upon arrival they completed the pre-SIGI

materials (Consent Form, SIGI User Information Form, Career Decision Scale, and Vocational Preference Inventory; see Appendices A-D, respectively). They then proceeded to use SIGI independently and at their own pace for all or any portion of their allotted two hour period.

Upon completion, or when they elected to discontinue use, students returned to the receptionist to indicate that their use of SIGI was complete, or that they wished to reschedule for an additional one hour appointment. In the former instance, students completed the post-SIGI materials (Career Decision Scale, and SIGI Evaluation Questionnaire; see Appendices C and E, respectively), ending their participation in the study. In the latter case, students returned on one or more occasions to continue their use of SIGI. Upon completion of the system, or when they decided to terminate its use, these students also completed the post-SIGI materials, ending their participation in the study.

Independent Variables

As discussed in the previous chapter, participants' task or people orientation represents the central independent variable under investigation in the present study. However, as is always the case in correlational research, additional extraneous variables which may account for the variance in the dependent variable have to be taken

into consideration. The potential influence of several such variables have been cited in the literature; for example, participants' intelligence, grade point average, socioeconomic status, cognitive strategies, sex, attitude toward computers, experience with computer programming or game-playing, etc.

In the present study, participants' sex and prior CACGS use have been included as the second and third independent variables under investigation. The reasons for selecting these particular predictor variables, and excluding others, follows:

1. The interaction of treatment strategy and sex is a common research theme among counseling and career-related outcome studies. Although there is little evidence to suggest that males and females differ significantly in terms of intellectual-cognitive functions (Maccoby & Jacklin, 1974), the sexes are undoubtedly socialized in a manner that would differentially influence their attitude toward and comfort with computers. Haring-Hidore (1984) claims that for women, "the social environment generally has not encouraged exploration into the mechanical and technological world that is commonly experienced by men" (p. 140).

2. Common sense suggests that participants who had previously used CACGS are likely to approach SIGI with a positive attitude regarding CACGS in general. Conversely, it would seem logical that those who previously disliked or did not benefit from their use of CACGS would be less likely

to voluntarily use SIGI than those who had previously valued and/or benefitted from the experience.

3. Other potential demographic predictor variables did not "naturally occur" in sufficient number to allow for their examination. For example, only 5 of the 69 participants in this study identified themselves as minority group members. Also, many of the participants were first quarter freshmen who had no college grade point averages to report. The relatively few grades that comprise the second and third quarter freshmen GPA's are of doubtful value for determining a student's academic progress. In addition, because so many participants were undecided about their major, that variable could not be examined. In contrast, males and females, as well as previous CACGS users and nonusers, both participated in sufficient number to allow for investigation.

4. Orientation (task or people), sex and previous CACGS use are all easily and accurately measured. These variables would likely be perceived as relevant to career counselors, in contrast to the more esoteric and/or unrelated psychological or demographic independent variables often encountered in the literature (e.g., locus of control, birth order, self-esteem, etc.).

5. The number of participants in the present study largely dictated that no more than three predictor variables be included in the multiple regression formula.

Dependent Variables

The three dependent variables under investigation in the present study are users' evaluation of SIGI, time spent on SIGI, and post-SIGI career decisiveness. The recommendations of numerous authors concerning career counseling research criteria influenced the selection of dependent variables and criterion measures in this study. Some of those suggestions involved the inclusion of multiple criteria (Fretz, 1981; Oliver, 1979), behavioral and nonreactive measures (Cooper, 1976; Webb, Campbell, Schwartz, & Sechrest, 1966), instruments with adequate psychometric properties (Jenson, Coles, & Nestor, 1955; Zytowski & Betz, 1972), instruments which are consistent with the systems' objectives (Cairo, 1983), and criteria which are potentially valuable yet previously neglected (Cairo, 1983). A description of the three dependent variables and the procedures for their measurement follows.

SIGI Evaluation Questionnaire

As earlier discussed (see section on CACGS Research) numerous descriptive studies have reported favorable user reactions to SIGI (e.g., Chapman et al., 1977; Nickerson & Davis, 1983; Sampson & Stripling, 1979) and other CACGS (e.g., Reardon et al., 1982; Ryan et al., 1980). The nature of this particular criterion measure is such that it

precludes the use of control group data. This problem can be minimized by comparing the evaluations of treatment subgroups, or two or more treatment groups, on the basis of multiple independent variables. However, as Cairo (1983) points out, most CACGS outcome studies involve a single, undifferentiated treatment group. What has resulted is an abundance of descriptive accounts of generally favorable user reactions.

In past investigations, user reactions have been procured through the use of questionnaires constructed by the investigators or the CACGS publishers (e.g., DISCOVER Foundation's DISCOVER Student Questionnaire, and Educational Testing Service's SIGI Evaluation Questionnaire: Form E). Apparently no efforts have been made to establish the reliability or validity of such measures. In the present study posttest scores on the Career Decision Scale and time spent on the system will both serve as tests of concurrent validity of the SIGI Evaluation Questionnaire in use. It is predicted that evaluation scores will be related to scores on the Career Decision Scale; that is, favorable ratings are related positively to decidedness and negatively to undecidedness. It is further predicted that favorable ratings will be positively related to task orientation and negatively related to people orientation.

The SIGI Evaluation Questionnaire developed for use in the present study consists of 11 Likert-style items related to the system's components and the user's overall

impressions of the system's usefulness. Ten of the 11 items were taken verbatim from the Educational Testing Service's SIGI Evaluation Questionnaire: Form E. Revisions were made according to the recommendations of several Michigan State University career counselors familiar with SIGI. Those revisions include the addition of the item "How likely would you be to recommend SIGI to a friend?" Three items from Form E were excluded because they dealt with subject matter absent from Michigan State University's version of SIGI.

The four-point Likert-style method of response has been substituted for the ABCDF scaling method used in ETS's version because of the former's similarity to the Career Decision Scale's scaling procedure, and its frequent use in attitude scale construction. It is doubtful that the five-point ABCDF scale represents a valid summated rating procedure. Given today's "grade inflation" and the negative attitude of many students toward a grade of "C," such a "neutral" item may represent a source of "response bias" (Nunnelly, 1978). In fact, the use of this ABCDF scale by ETS and CACGS researchers may help to explain the inordinately favorable SIGI user reactions in virtually all studies reported in the literature. The instrument is scored by tallying the responses to each of the eleven items. The scores can range from 11 (very favorable rating) to 44 (very unfavorable rating).

A test of internal consistency was performed to assess the instrument's reliability (see Secondary Statistical

Results). To summarize, in the present study the evaluation form in use was subjected to several procedures, and constructed in such a manner, to provide evidence of its validity and reliability. They include (a) using items that have previously been employed in numerous SIGI studies, (b) eliminating inappropriate items, (c) revising the scaling method in an attempt to provide consistency between measures and improve its psychometric properties, (d) constructing the questionnaire with the input of career counselors experienced in the use of SIGI and similar rating scales, (e) correlating the ratings with other relevant variables, and (f) subjecting the instrument to a test of internal consistency.

As previously discussed, numerous CACGS studies have elicited user reactions, reporting generally favorable ratings. However, there has apparently been little or no attempts to (a) distinguish between evaluators according to relevant personality or demographic traits, (b) determine the relationship between user ratings and other variables, or (c) provide evidence of the rating scale's validity and reliability. The present study has been designed to address all three of these seemingly important factors.

Career Decision Scale

A great deal of the concern of vocational development theorists relates to the process of career decision making,

and the problem of career indecision, or its counterpart - career decidedness. Harren (1979) and Van Matre and Cooper (1984) discussed the importance of assessing career indecision when counseling college students. Carney, Savitz, and Weiskott (1979) and Harman (1973) reported that undecided students seeking help with vocational decisions comprise a majority of the clientele of most university counseling centers. Numerous studies have compared decided and undecided students, revealing that undecided students are more anxious (Kimes & Troth, 1974; Walsh & Lewis, 1972), more dependent (Ashby, Wall, & Osipow, 1966), more dogmatic (Maier & Herman, 1974), have lower self-esteem (Barrett & Tinsley, 1977; Resnick, Fauble, & Osipow, 1970), and have lower high school and college grade point averages (Lunneborg, 1975) than decided students. These findings notwithstanding, Osipow (1983) claims that such students have revealed "few systematic reliable personality or ability factors involved in whether an individual is decided or undecided about a career" (p. 283).

It is generally recognized that it is not enough to merely supply vocationally indecisive clients with information about occupational alternatives and assume they will use it to make wise decisions (Mendonca & Siess, 1976). Barak, Carney, and Archibald (1975) found that little relationship existed between the amount of vocational information seeking participants engaged in, and their level of career decidedness. This would support SIGI developer

Martin Katz's contention that a computerized career guidance system must teach a decision making process as well as supply vocational information to its users.

The Career Decision Scale (CDS; Osipow, Carney, Winer et al., 1976) has been employed in the present study as a meaure of career decidedness. The CDS was designed to identify barriers that prevent individuals from making educational and career decisions. It is based on the rationale that a finite number of relatively discrete circumstances are responsible for problems individuals have in reaching appropriate closure in implementing career decisions (Osipow, 1980).

The instrument consists of 16 Likert-style items which are commonly reported explanations for career indecision. Two additional items indicate the level of certainty of a career and school major and, if included, are scored negatively with the other items. Thus, the first two items measure decidedness, and items 3 through 18 measure indecision. A numerical value for each item can be assigned to each response of 1, 2, 3, or 4. An index of indecision ranging from 16 (1×16) to 72 (4×16) can then be produced for each student (Taylor, 1982; Utz, 1983). The higher the score, the greater the level of career indecision. A 19th item is an unscored item that offers the respondent the opportunity to clarify previous responses.

Some researchers have included the first two items in the generation of a global indecision score (MacDonald,

1984; Niece & Bradley, 1979). However, the majority of the research directed at demonstrating the instrument's reliability and validity appears to have used only items 3-18 in the scoring procedure. Since the CDS developers (Osipow, Carney, Winer et al., 1976) do not describe a method for scoring, the more commonly used procedure of including only items 3-18 has been employed in the present study.

The reported test-retest correlations of CDS items range from .70 to .90 for the entire scale (Osipow, Carney, Winer et al., 1976). Osipow, Carney, and Barak (1976) found that test-retest correlations for the sum of items 3-18 were .90 and .82 for two samples of college students over a two week period. Slaney, Palko-Nonemaker, and Alexander (1981) reported an overall test-retest correlation of .70 over a six week period with 857 college students.

Numerous studies have established its validity as an instrument to measure the reduction of career indecision (Osipow, 1980; Sutera, 1977; Taylor, 1979). For example, in two CACGS outcome studies employing the CDS, Glaize and Myrick (1984) and Pinder and Fitzgerald (1984) found that college students using the computerized system CHOICES and DISCOVER, respectively, had significantly greater career decidedness gain scores than did control group members. Also, as previously described, Marin (1984) and Kapes et al. (1985) used the CDS to measure decreases in career indecision following participants' CACGS use.

In addition, numerous career intervention outcome studies not involving CACGS have employed the CDS as a dependent measure (Carney, 1977; Cooper, 1986; Neice & Bradley, 1979; Rubenstein, 1978; Taylor & Betz, 1983; Utz, 1983). Slaney, Palko-Nonemaker, and Alexandr (1981) found that the total score of the CDS and all of the individual items discriminated between vocationally undecided and decided undergraduates. Similarly, Limberg (1980) found that students seeking assistance at a Career Center or enrolling in a career planning class showed a higher level of indecision than a group not pursuing career assistance. In addition, several studies (Barak & Friedkes, 1981; Neice & Bradley, 1979; Slaney, 1978) found no differences by sex, indicating that the CDS does not reflect gender. Therefore, there appears to exist ample empirical evidence demonstrating the CDS's reliability, validity, and sensitivity to career decidedness changes due to career counseling interventions.

In his review of CACGS-related research, Cairo (1983) noted that the outcomes which were measured by various career-related instruments were often inconsistent with the objectives, content and format of the system being evaluated. The CDS appears to have substantial reliability and acceptable validity for the purpose of measuring levels of career decidedness. Career decidedness, "the ability to clarify one's career goals" (Glaize & Myrick, 1984), is generally considered by vocational theorists to be a

learnable skill. SIGI, as earlier discussed, is designed to clarify values as they related to occupational choice, and teach a decision making procedure. Thus, the CDS would appear excellently suited to the purpose of evaluating SIGI's effectiveness.

A particular advantage of the CDS is its brevity. Because the participants in the present study were regularly scheduled SIGI users who had to arrange their SIGI use around their class schedules, it would have been unrealistic and unreasonable to require the completion of overly time-consuming inventories before and after the use of SIGI. This is especially important because of the additional required completion of the Consent Form, VPI, SIGI User Information Form, and SIGI Evaluation Questionnaire.

In at least one similar study (Kapes et al., 1985) the length and expense of one of the criterion measures (Career Development Inventory) necessitated that only 40% of the participants complete the instrument. As the authors reported, "the CDI... is an expensive instrument and takes considerable time to administer, therefore it is probably not a good instrument to use on further research with computer-based guidance systems..." (pp. 11-12). Brevity is particularly germane as one of the predominant complaints registered in reaction to CACGS use is the amount of time required for their use.

An additional advantage of the CDS over the more commonly used career "development" or "maturity" instruments

(e.g., Career Development Inventory, Career Maturity Inventory, and Assessment of Career Development) relates to the appropriateness of using vocational maturity as a criterion variable in such research. In most CACGS investigations vocational maturity has been measured just before and immediately after participants used a particular system. But, as Cairo (1983) noted, "since vocational maturity is, by definition, a developmental process, to expect resounding increases over short periods of time even with the use of computer-based systems is probably unreasonable" (pp. 57-58). Conversely, increased "decidedness" may reasonably be expected as a result of the acquisition of decision making skills and career/educational information over a relatively brief period of time. Therefore, the CDS appears better suited to discerning such changes in decidedness than the more traditional "career development" instruments.

There exist several additional instruments which, like the CDS, purport to measure career decidedness. The Vocational Decision Scale (Jones & Chenery, 1980) was designed to measure three dimensions of this particular construct: degree of decidedness, comfort with decidedness, and reasons for decidedness. However, the instrument has apparently generated little or no scientific attention since its development and initial testing. Similarly, Holland, Daiger, and Power's (1980) My Vocational Situation has apparently received considerably more use as a clinical

diagnostic and screening device, than as an experimentally valid measure of career decidedness. Nonetheless, pending more extensive use in outcome research, My Vocational Situation would appear to be potentially well suited to the assessment of CACGS effectiveness.

The Assessment of Career Decision Making (Harren, 1976), previously called the Vocational Decision Making Checklist bears considerable similarity to the CDS. Like the CDS, it has been used to measure the outcomes of various career counseling interventions (Cochran et al., 1977; Pinder & Fitzgerald, 1984; Smith & Evans, 1973), and appears to possess adequate reliability and validity. However, only one portion of this 56-item inventory measures a construct comparable to the CDS's "vocational decidedness;" the 20-item Occupational Decision Making Scale's measure of "vocational commitment." Studies by Carney (1977), and Osipow and Schweikert (1979) found significant correlations between overall scores on the ACDM and CDS. These two instruments appear in the literature with approximately equal frequency, possess adequate validity and reliability, and appear to be measuring a similar construct. No distinct advantages of either instrument are apparent.

Finally, the Vocational Decision Making Difficulty Scale (Holland & Holland, 1977), a 13-item scale devised to assess the number of reasons given by persons for vocational indecision, has been utilized in career counseling outcome studies (Johnson, Smither, & Holland, 1981; Slaney, 1980).

A study by Rogers (1980) found convergent validity between the Vocational Decision Making Difficulty Scale and the CDS, which were significantly positively correlated. However, the CDS appears to have generated more empirical scrutiny and support, and thus was deemed preferable for use in the present investigation.

Time Spent on SIGI

According to Cairo (1983) "one of the most glaring omissions from the literature is an examination of how the amount of time spent using a system affects the user... this is both an obvious and valuable research question" (p. 58). In the only published CACGS study to include time spent on the program as a dependent variable, Myers, Lindeman, Thompson, and Patrick (1975) found a positive correlation between use-time and gain scores related to planning orientation and knowledge, and use of resources for occupational exploration. However, it is noteworthy that heavy users also tended to have higher pretest scores than light users on the aforementioned measures of career maturity.

Some computerized career information systems, such as GIS, offer the first-time user the opportunity to bypass the initial guidance component. For this reason users who are only interested in the acquisition of career-related information may only spend from 5-10 minutes on the system.

However, first-time users of SIGI are required to complete the initial Values and Locate subsystems, which necessitates a greater investment of user time and energy. Individuals who spend less than two hours on SIGI have only accessed a fraction of the system's material. It would appear logical to assume that the extended-time user (two hours or more) will derive greater benefits from SIGI than the brief user.

In their unpublished descriptive study, Nickerson and Davis (1983) sought explanations from SIGI users who had not completed all of the program's subsystems. According to the authors, 57% of the responses "could be interpreted very positively, i.e., needed information was found, jobs were obtained, assignments completed, other resources were used, or decisions concerning a major or career were made" (p. 7). Furthermore, 45% of the noncompleters reported their intention of returning to finish the program at a later date. Such findings, although tentative, lend doubt to the assumption that noncompletion or brief use of a CACGS indicates program ineffectiveness and/or client dissatisfaction. One purpose of the present study is to shed light on this issue involving CACGS usage time.

Two questions (see Appendix E) will be asked of each participant upon completion of SIGI to determine the amount of time spent on the system. Unfortunately, the logistics of SIGI use in the four settings rendered the recording of student usage time by receptionists impossible.

Additional Forms and Instrumentation

Two additional instruments, the Vocational Preference Inventory, and the SIGI Users Information Form were used to obtain information concerning participants' personality and demographic characteristics. In addition, a Consent Form was used to briefly describe the study and obtain the students' written consent to participate. Descriptions and the rationale for these instruments' use follows.

Vocational Preference Inventory

The VPI was developed by Holland in 1978 as both a vocational interest measure and personality inventory. The rationale for the development of the VPI was based on the notion that preferences for specific occupations are expressions of personality. This brief, self-administered inventory requires that respondents indicate their attitudes toward 160 occupations. Eleven scores are generated, six of which (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional) comprise the previously described Holland's typologies. Inventory users blacken a "Yes" circle by those occupations that interest or appeal to them; a "No" circle by those occupations they dislike or find uninteresting; or make no marks when they are undecided about an occupation. The VPI is scored by tallying the number of occupations marked "Yes," ranging from a low of 0

to a high of 14. Thus, for each of the six Holland's typologies, a score of 0 to 14 is generated.

The test-retest reliability coefficients, ranging from .62 to .98 with college seniors over six weeks, and .61 to .93 with college freshmen over one year (Holland, 1978), suggest that the instrument has moderate to high reliability. Likewise, internal consistency scores ranging from .69 to .85 with employed adults, and .76 to .89 with college freshmen, demonstrate the scales to have moderate to high homogeneity of content.

The VPI has been subjected to numerous tests of construct validity (Cole & Hanson, 1971; Edwards & Whitney, 1972; Lacey, 1971). Similarly, a large number of concurrent validity studies (Dunnette, Kirchner, & DeGidio, 1958; Gaffey, 1972; Holland, 1960) have demonstrated that "the VPI scores differentiate between men and women; between salesmen, advertising and scientific personnel; between normal, psychiatric, TB patients and psychopaths; and between psychotic and non-psychotic patients" (Walsh, 1972, p. 168). Walsh further concluded that "the results of the validity studies lend support to the meaning attributed to the scales and to the rationale underlying the development of the inventory" (1972, p. 168). Hundreds of subsequent studies using and examining the VPI, and the continued popularity of the instrument suggest that Walsh's generally positive assessment is shared within the career counseling and research community today.

There are several instruments available by which experimental participants' General Occupational Theme can be assessed: the VPI, Strong-Campbell Interest Inventory, Self-Directed Search, and Personal Survey. The rationale for using the VPI in the present study, rather than one of these other instruments, follows:

1. According to Walsh (1972), "In terms of application, Holland's theory and the VPI are easily translated into research terms" (p. 168). Conversely, the Personal Survey, which fails to receive mention by Holland in his 1973 book, has apparently received little scientific attention since its development in 1963. In fact, in career counseling outcome studies where the identification of the participants' RIASEC theme is required (e.g., Cox & Thoreson, 1977; Guthrie & Herman, 1982; Holland & Whitney, 1968; MacDonald, 1984; Whitney & Whittlesey, 1972), the VPI appears to be the overwhelmingly favored instrument.

2. The VPI is a nonreactive measure whose administration alone is unlikely to hinder or enhance one's career decidedness, or influence any career related intervention method. Such is not the case with the Self-Directed Search, which is a self-administered "vocational counseling experience" (Crites, 1978, p. 1608).

3. The VPI is brief, easily scored, and inexpensive. In contrast, the Strong-Campbell Interest Inventory, requires rather expensive and time consuming computer scoring, and consists of approximately twice the number of

items as the VPI.

4. The VPI possesses very acceptable psychometric properties (see above). Unlike the SCII, separate female and male scales do not exist. This undoubtedly more accurately reflects student interests, and the accessibility of occupations across genders in the 1980s. The VPI scales are equal in length and have "useful homogeneity, ranging from .76 to .85" (Holland, 1966). Such is not the case with the Self-Directed Search, a shortcoming cited by Crites (1978).

Other less frequently practiced procedures exist for ascertaining people's typological codes. For example, Grandy and Stahmann (1974), and Schneider, DeWinne, and Overton (1980) recorded participants' occupational choices and subsequently classified them according to Holland's (1974) Occupational Finder codes. However, such a procedure is infrequently used and seems to offer no advantage over the more rigorously researched VPI procedure. Therefore, to summarize, the VPI's favorable psychometric features, gender-neutral occupational titles, brevity, simple administration, low cost, and popularity within the career counseling and research community make it the preferred procedure for determining participants' General Occupational Themes.

Congruence, consistency, and differentiation are three concepts related to Holland's theory that warrant brief consideration herein. Congruence is said to exist when

people actually choose environment types compatible with their own typologies. Consistency refers to the similarities of personality types to other personality types within Holland's schema. A person is said to be well differentiated when his/her profile closely resembles a single type and shows little resemblance to other types. A poorly differentiated or undifferentiated profile is characterized by about equal numbers of the six types. These concepts, common to many studies involving Holland's typologies, are excluded from the present investigation, despite Holland's (1983) assertion that the three concepts "are needed to apply the theory to practical problems" (p. 37). The reasons for this exclusion are as follows:

1. Congruence is a match between a typology and a vocational environment, not a personality trait per se. The participants in the present study are predominantly pre-employed underclassmen with either undeclared or only tentatively declared majors. Therefore, in the present study, the common practice of matching according to college major or present occupational status is not relevant or even possible.

2. Holland (1973) and Bruch (1978) have stressed the importance of including all three criteria in client-counselor matching research based on Holland's theory. However, the present study involves the far less frequently addressed issue of client-treatment interaction. The relevance of, and need to consider these three variables

in such attribute-treatment interaction studies remains unsubstantiated.

3. Few studies have provided evidence for the validity of the concepts of consistency and differentiation (Wigington, 1983). The few studies focusing on differential treatment outcomes according to clients' Holland's typologies (e.g., MacDonald, 1984; Whitney & Whittlesey, 1972) generally fail to support the necessity of including these dimensions. In fact, the concepts of consistency and differentiation are absent from Osipow's (1983) most recent review of Holland's theory, even though an earlier edition (1973) depicted the constructs as important to Holland's theory.

4. The only extant attribute-treatment interaction study employing Holland's typology (Kivlighan et al., 1981) did not take into consideration these three dimensions. As previously reported, this study's results generally supported the conclusion that consonance between client personality type and type of treatment enhance treatment effectiveness. The only criterion for classification within one of the six Holland's typologies was participants' single high point code.

5. Like the Kivlighan et al. (1981) study, the majority of investigations employing the VPI to classify participants appear to include the primary code only (e.g., Schneider, DeWinne, & Overton, 1980; Whitney & Whittlesey, 1972). Two additional factors may further explain the sole use of the

dominant VPI score in determining participants' types. First, a paucity of functional definitions of the three dimensions exists. For example, studies that have relied upon "well differentiated" profiles all differ in their criteria for differentiation (e.g., two, three, or four raw score points above the next highest type). Second, the inclusion of one or more of the dimensions drastically reduces the usable participant population. For example, MacDonald (1984), who included only participants who qualified on the three dimensions according to criteria he had established, found that 75% of a community college student sample, 70% of a graduate student sample, and 68% of a mixed sample failed to qualify for inclusion in the study. Experimenters are unlikely to eliminate approximately 70% of their sample in the absence of compelling empirically-based evidence for doing so.

As discussed in the section on Holland's theory, participants with high point codes of C, I, or R are classified as "task oriented;" those with S or E primary codes are "people oriented." Ten participants with Artistic primary codes were categorized as task or people oriented according to their secondary codes. Four participants with Artistic codes and no scores (zeroes) on the remaining five types were excluded from the study.

Unlike the other five types, the Artistic individual does not appear to be easily classifiable as task nor people oriented. Like task oriented individuals, Artistic types

prefer to work with objects or machines, than people (Osipow, 1983). However, like people oriented individuals, Artistic types dislike structure, and have a great need for individual expression (Campbell & Hansen, 1981). Thus, the person scoring high on the Artistic code would appear to possess similarities and dissimilarities with both the task and people oriented individual.

An examination of the Strong-Campbell Interest Inventory's occupational code types reveals a great disparity between Artistic types; largely a function of their secondary and tertiary codes. For example, a drafting technician, who relies heavily on well-ordered, mathematical activities is an "AR" (task oriented) type. In contrast, an "AE" (people oriented) type, such as Public Relations Director or Advertising Executive would rely more on his or her interpersonal and creative skills in the workplace. Thus, Artistic types can be either task or people oriented, according to their secondary and terciary codes.

Relatedly, the Artistic classification appears to comprise a more diverse group of people and work environments than the other five types. For example, lawyers, interior decorators, and music teachers would appear to have more dissimilarities than similarities. However, the classifications gain credence when their secondary codes are taken into consideration (I, E, and A, respectively) (Campbell & Hansen, 1981). Thus, it would seem reasonable to classify Artistic participants in the

present study as either task or people oriented according to their secondary code. Admittedly however, there is no precedent for such a practice, as the only other study employing this "orientation" schema (Kivligan et al., 1981) did not include Artistic types. The possible confounding effects of such a procedure are examined in the Discussion section.

In addition, a separate analysis will be performed for "Pure SE's," ten participants whose primary and secondary codes are Social and Enterprising, in either order. The "Pure SE's" are expected to epitomize the people oriented classification, and any differences between their scores and those of the larger sample of SE's (people oriented) and the ICR's (task oriented) bears examination. Unfortunately, no such "Pure ICR" type was derived due to the small number of task oriented participants.

SIGI User Information Form

A SIGI User Information Form was developed for use in the present study (see Appendix B). The 12-item form was designed to gather information of potential value to such a correlational study. Some of the information was statistically analyzed to determine its possible confounding effects on the findings. For example, data concerning SIGI users' sex (item #3), and previous experience with CACGS (item #9) were included as independent variables in the

multiple regression equation (see Statistical Analysis Procedures). Other potential intervening variables such as age (item #2), grade point average (item #7), race (item #4), college class (item #6), and current career counseling status (item #12) were excluded due to a lack of group variability, or insufficient numbers to warrant analysis. No hypotheses were generated, nor analyses performed, for items 5, 9, 10, and 11, which were included because of their potential value for subsequent examination. No attempts were made to check the validity of these 14 self-report responses.

Consent Form

All participants were required to sign a standard Consent Form (see Appendix A) prior to participation in the study. The form served to explain the procedures for completing the pre- and post-SIGI materials, and outline both the participants' role and rights within the study. In addition, general results were offered to any students who requested them. No such requests were made.

Primary Statistical Analysis Procedures

Statistical analyses were performed at Colorado State University on a Control Data Corporation Cyber mainframe using the Statistical Package for the Social Sciences (SPSS;

Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). In order to test Hypotheses 1, 2, and 3 (see Research Hypotheses section) three separate analyses of variance were performed. Hypotheses 1 and 2 were tested using Analyses of Variance (SPSS: ANOVA); Hypothesis 3 was tested with an Analyses of Covariance (SPSS: ANCOVA) to control for initial differences in career decisiveness scores. Participants were categorized as either people oriented (N=44) or task oriented (N=18).

To determine the relationship between the three dependent variables, Hypotheses 4, 5, and 6 were tested through the calculation of separate correlation coefficients. Hypothesis 4 was tested using a Pearson Product Moment Correlation Coefficient (SPSS: PEARSON CORR). Hypotheses 5 and 6 were tested using Partial Correlation Coefficents (SPSS: PARTIAL CORR) in order to statistically control for the effects of the pre-SIGI levels of career decisiveness. The correlations are, respectively: (a) Time spent on SIGI and SIGI evaluations; (b) Time spent on SIGI and post-SIGI career decisiveness; and (c) SIGI evaluations and post-SIGI career decisiveness.

Secondary Statistical Analysis Procedures

As discussed in the Exploratory Issues section, a number of additional tests will be performed. They are as follows:

1. In addition to the aforementioned people and task orientation classifications, the people oriented participants were subclassified as either "Pure SE" (N=10: those participants whose primary and secondary codes were Social and Enterprising, in either order; or "People-minus Pure SE" (N=34: those people oriented participants who were not Pure SE's). In addition to comparing the task and people oriented participants' mean scores on the three dependent variables (tests of Hypotheses 1-3), the following mean differences between group scores were calculated (using SPSS: ANOVA when comparing means for time and evaluation; and ANCOVA when comparing means for post-SIGI career decisiveness): (a) "Pure SE" and task oriented participants; (b) "Pure SE" and "People-minus Pure SE" participants; and (c) "People-minus Pure SE" and task oriented participants.

2. A T-test for Dependent Samples (SPSS: T-TEST PAIRS) was performed to measure mean differences between pre- and post-career decisiveness scores.

3. A Coefficient Alpha test (SPSS: RELIABILITY) was performed to determine the internal consistency of the investigator-created SIGI Evaluation Questionnaire.

4. In a further attempt to determine the relationship between the two levels of independent variable (task and people orientation) and the three dependent variables (time spent on SIGI, evaluation of SIGI, and career decisiveness following the use of SIGI) three separate Stepwise Multiple

Regression procedures (SPSS: REGRESSION) were performed. The third dependent variable, career decisiveness following the use of SIGI, has been determined through participants' post-SIGI Career Decision Scale (CDS) scores. Pre-SIGI CDS scores have been included in the multiple regression formula as a covariate to control for the effects of initial differences. In an attempt to control for the effects of extraneous variables, two additional independent variables, sex and previous use of CACGS have been included in the multiple regression equations. Thus, three separate stepwise multiple regression equations were performed, one for each dependent variable. In each equation, the three dichotomous independent variables are: (a) orientation (task or people), (b) sex (female or male), and (c) previous use of CACGS (yes or no).

5. In order to determine if differences existed between those participants who were and were not concurrently seeing a career counselor, Analyses of Variance (SPSS: ANOVA and ANCOVA) were performed to compare mean scores for these two groups on each of the three dependent variables. Although no interaction between orientation (task or people) and concurrent contact with a career counselor (yes or no) was predicted, a chi-square test was performed to determine if a systematic relationship exists between these two variables.

6. A table was produced to non-statistically compare this study's participants, 35 non-completers of necessary forms, and a comparison group of MSU SIGI users, on eight

variables.

7. A table was produced to non-statistically compare the dependent variable mean scores of task and people oriented participants when "Artistic" individuals were included and excluded from analysis (see Table 6). Because of the small number of Artistic types whose secondary codes were employed (four were classified as task oriented, and six as people oriented), a statistical analysis of mean differences would have been meaningless.

CHAPTER IV

RESULTS

In this chapter, the statistical results of the experiment will be presented. First, the central hypotheses (1-3) will be addressed. As previously discussed, participants (n=62) were classified as either task or people oriented, according to their VPI primary codes (or secondary codes in the case of Artistic types). The three dependent variables were SIGI evaluations, time spent on SIGI, and career decisiveness. Hypotheses 4-6 posit that the three pairs of dependent variables are positively correlated to one another.

Hypothesis 1: Task oriented participants will evaluate SIGI more favorably than people oriented participants. An Analysis of Variance revealed that the mean scores of task oriented participants (23.89) were not significantly different than the mean scores of people oriented participants (24.20). Hypothesis 1 was not confirmed (see Table 1).

Hypothesis 2: Task oriented participants will spend more time on SIGI than people oriented participants. An Analysis of Variance revealed that, on the average, task oriented participants spent more time on SIGI (2.57 hours) than people oriented participants (2.08 hours). However, these differences did not reach statistical significance. Hypothesis 2 was not confirmed (see Table 1).

Hypothesis 3: Task oriented participants will be more career decisive following the use of SIGI than people oriented participants. After being adjusted for pre-SIGI levels of career decisiveness, an Analysis of Covariance revealed that task oriented participants' mean post-SIGI career decisiveness scores (35.45) were not significantly different than people oriented participants' mean career decisiveness scores (35.75). Hypothesis 3 was not confirmed (see Table 1).

Hypothesis 4: A positive relationship exists between time spent on SIGI and SIGI evaluations. This hypothesis was tested using a Pearson Product Moment Correlation Coefficient. The correlation between these two dependent variables was significant at $p < .05$ ($r = .-20$). Because evaluations were reversed scored (i.e., low evaluations imply high ratings), the negative correlation indicates a positive relationship between ratings and time, as predicted. Hypothesis 4 was confirmed.

Hypothesis 5: A positive relationship exists between time spent on SIGI and career decisiveness following SIGI use. This hypothesis was tested using a Partial Correlation Analysis. Controlling for pre-test differences in career decisiveness, the analysis resulted in a non-significant correlation ($r = -.10$). Although not statistically significant, this correlation was in the predicted direction. Hypothesis 5 was not confirmed.

Hypothesis 6: A positive relationship exists between

SIGI evaluations and career decisiveness following SIGI use. This hypothesis was tested using a Partial Correlation Analysis. Controlling for pre-test differences in career decisiveness, a correlation significant at $p < .01$ ($r = .28$) was found. In this case, both lower evaluation scores (i.e., higher ratings) and lower CDS scores, (i.e., increased decisiveness) were predicted. This accounts for the positive correlation. Hypothesis 6 was confirmed. Thus, two of the three pairings of dependent variables were, as hypothesized, correlated to a statistically significant extent.

Secondary Statistical Analyses

The results of the seven previously discussed "exploratory issues," are as follows:

1. As described in the Methodology section, people oriented participants were subcategorized as "Pure SE's" and "People-minus Pure SE's." Three additional pairings of participants were created: (a) "Pure SE" and task oriented participants; (b) "Pure SE" and "People-minus Pure SE" participants; and (c) "People-minus Pure SE" and task oriented participants. Analyses of Variance revealed no significant differences among these groups' mean scores on the three dependent variables (see Table 1).
2. Pre- and post-SIGI career decisiveness scores were tested using a T-test for Two Dependent Samples. As expected, the

mean difference (pre = 38.97; post = 35.90) was statistically significant ($p < .001$).

3. The SIGI Evaluation Questionnaire demonstrated high internal consistency at .88, as calculated using Coefficient Alpha.

4. Three separate Stepwise Multiple Regression analyses were performed on the three dependent variables. Due to missing data, seven participants were eliminated from the multiple regression equations. In addition to orientation, sex and previous use of a CACGS were included as two additional dichotomous independent variables. Pre-SIGI career decisiveness scores were used as a covariate when the dependent variable was post-SIGI career decisiveness. The covariate was used to statistically control for initial differences on career decisiveness scores. As depicted in Table 2, none of the independent variables accounted for significant variance in any of the three criterion variables.

5. In an attempt to determine if clients differed according to whether or not they were concurrently seeing a career counselor, mean scores for these two groups were compared for each of the three dependent variables. An Analysis of Variance revealed that the mean evaluation scores for the two groups did not differ to a statistically significant extent. Non-significant differences were also found between the two groups' mean time scores. However, an Analysis of Covariance revealed that, after adjustment for pre-SIGI

career decisiveness, students who were not concurrently seeing a career counselor were more indecisive following the use of SIGI, than those who were in contact with a counselor. The mean scores and standard deviations for each dependent variable appear in Table 3. The significance of these results is covered in the Discussion section.

In addition, a Chi-Square test was performed to determine if participants who were and were not concurrently seeing career counselors were categorized as either task or people oriented to a greater extent than would be expected by chance. As Table 3 indicates, the Chi-Square (.03, df=1) did not reach statistical significance. Thus, no systematic relationship was found to exist between orientation and concurrent counselor contact.

6. A non-statistical comparison was done between participants, non-completers, and a comparison SIGI user group, on eight separate variables (sex, race, class, previous CACGS use, orientation, concurrent contact with a career counselor, pre-SIGI career decisiveness, and age). The only potentially meaningful difference that appears to exist, in this author's opinion, is the somewhat smaller percentage of females (60%) in the comparison group as compared to the participant (71%) and non-completer (74%) groups (see Table 6). The potential significance of such a finding is discussed in the subsequent chapter.

7. A non-statistical comparison was done between the dependent variable mean scores of the task and people

oriented participants, according to whether or not Artistic secondary codes were included or excluded from the analysis (see Table 5). No obvious differences between means appear to exist.

Table 1

Means and Standard Deviations:
Three Dependent Variables by Type
(Tests of Hypotheses 1-3)

Dependent Variable	Orientation	N	Mean	Stand. Dev.
SIGI Evaluations[a]				
	People	44	24.22	5.90
	People-minus Pure SE	34	24.20	6.00
	Pure SE	10	24.30	5.77
	Task	18	23.89	5.52
Time Spent on SIGI[b]				
	People	44	2.25	.88
	People-minus Pure SE	34	2.08	.86
	Pure SE	10	2.64	.91
	Task	18	2.57	1.23
Post-SIGI CDS Scores[c]				
	People	44	36.69[d]	6.95
			36.75 adj.[d]	
	People-minus Pure SE	34	36.77	7.63
			35.75 adj.	
	Pure SE	10	36.70	4.64
			36.77 adj.	
	Task	18	34.50	7.83
			35.45 adj.	

[a] ANOVA revealed non-significant differences among means.

[b] ANOVA revealed non-significant differences among means.

[c] ANCOVA revealed non-significant differences among means.

[d] Observed means and means adjusted for pre-CDS scores.

Note: The total N=62. "People-minus Pure SE" and "Pure SE" are subgroups of the "People" (N=44) classification.

Table 2

Stepwise Multiple Regressions:
Three Dependent Variables

Dependent Variable	Step	Independent Variable	Multiple Correlation (R)	R Square Increment[a]	Simple Correlation (r)
SIGI Evaluation					
(N=62)	1	Sex	.134	.018	-.134
	2	Use	.171	.011	-.131
	3	Orient	.172	.001	-.026
Time Spent on SIGI					
(N=62)	1	Orient.	.149	.022	.149
	2	Sex	.194	.016	.114
	3	Use	.207	.005	.108
Post-SIGI Decisiveness[b]					
(N=62)	1	Pre-CDS	.668	.446	.668
	2	Sex	.675	.009	.284
	3	Use	.680	.008	-.072
	4	Orient.	.681	.001	-.145

[a] Addition of each of the three independent variables to the three equations failed to account for significant variance in the respective dependent variables.

[b] Pre-SIGI career decisiveness scores were used as a covariate in this analysis.

Table 3

Means and Standard Deviations:
Three Dependent Variables By Contact With A Career Counselor

Dependent Variable	Counselor Contact	N	Mean	Standard Deviation
SIGI Evaluations[a]				
	Yes	18	22.94	6.45
	No	44	24.20	5.28
Time Spent on SIGI[b]				
	Yes	18	2.58	.91
	No	44	2.25	1.06
Post-SIGI CDS Scores[c]				
	Yes	18	34.56 adj.[d]	8.77
	No	43	36.47 adj.[d]	7.51

[a] ANOVA revealed non-significant differences among means.

[b] ANOVA revealed non-significant differences among means.

[c] ANCOVA revealed significant differences among means ($p<.05$)

[d] Means adjusted for pre-CDS scores.

Table 4.

Chi-Square Test of the Relationship Between Orientation and Contact With a Career Counselor

	Task-Oriented	People-Oriented
Seeing A Counselor	Observed = 11 Expected = 10.2	Observed = 24 Expected = 24.8
Not Seeing A Counselor	Observed = 7 Expected = 7.8	Observed = 20 Expected = 19.2

Chi-square = .03; df=1; .03 < 3.84 ($p<.05$)

Results indicate that there is no relationship between orientation and contact with a career counselor

Table 5

Mean Scores on Three Dependent Variables
When Artistic Types are Included and Excluded

	Evaluation	Time	Post-SIGI CDS[a]
Task-oriented including Artistic types (N=18)	23.89	2.57	35.45
Task-oriented excluding Artistic types (N=14)	25.50	2.90	35.21
People-oriented including Artistic types (N=44)	24.22	2.25	36.75
People-oriented excluding Artistic types (N=38)	22.70	2.35	35.11

[a] Means adjusted for pre-SIGI CDS scores

Note: Of the ten Artistic types whose secondary codes were used to determine task or people orientation, four were classified as task oriented and six were classified as people oriented.

Table 6

Demographics of Participants, Non-Completers, and Comparison Group SIGI Users

		Participants[a]	Non-Completers[a]	Comparison[b]
Sex				
	Female	49 (71%)	26 (74%)	382 (60%)
	Male	20 (29%)	9 (26%)	257 (40%)
Race				[c]
	Non-Minorities	64 (93%)	28 (85%)	425 (90%)
	Minorities	5 (7%)	5 (15%)	48 (10%)
Class				
	Freshmen	27 (40%)	18 (53%)	253 (41%)
	Sophomores	28 (42%)	11 (32%)	246 (40%)
	Juniors	7 (10%)	3 (9%)	72 (11%)
	Seniors	5 (7%)	2 (6%)	37 (12%)
	Graduate	0 (0%)	0 (0%)	12 (2%)
Previous CACGS Use				
	Yes	12 (19%)	8 (24%)	Not Available
	No	52 (81%)	26 (76%)	
Orientation				
	Task	18 (29%)	8 (27%)	Not Available
	People	44 (71%)	22 (73%)	
Presently Seeing a Career Counselor				
	Yes	15 (27%)	11 (33%)	Not Available
	No	22 (67%)	22 (67%)	
Pre-SIGI Mean CDS Score		39.0 (N=62)	40.2 (N=26)	Not Available
Mean Age		19.6 (N=61)	19.3 (N=33)	Not Available

[a] This data encompasses student SIGI users during the Spring, Summer, and Fall, 1985 quarters at the Counseling Center, Brody Hall, Wonders Hall, and Learning Resource Center.

[b] This data encompasses student SIGI users during the Fall, 1985 and Winter, 1986 quarters at the Counseling Center, Brody Hall, and Learning Resource Center. Fifteen of the same Learning Resource Center SIGI users during the Fall 1985 quarter are included in the Participant/Non-Completer and Comparison group data.

[c] This information was not available from Learning Resource Center.

CHAPTER V

DISCUSSION

This investigation represented an initial examination of the relationship that exists between individual student traits and the outcome of CACGS use. The central hypotheses received little statistical support. It was predicted that task oriented, in comparison to people oriented participants, would (a) spend more time on SIGI, (b) evaluate the program more positively, and (c) demonstrate greater degrees of career decisiveness. Mean differences among groups occurred in the predicted directions, but not to statistically significant extents.

The secondary hypotheses, which posited a positive correlation between the three dependent variables, received more, albeit modest, statistical support. It was found that statistically significant positive relationships existed between (a) time spent on SIGI and SIGI evaluations, and (b) post-SIGI career decisiveness and SIGI evaluations. No such statistically significant positive correlation was found to exist between time spent on SIGI and post-SIGI career decisiveness.

Negative findings nothwithstanding, the results of this investigation may have career counseling significance and suggest directions for subsequent research in this relatively new area of investigation. The following

discussion focuses on the hypotheses investigated in this study, addresses the theoretical and methodological strengths and weaknesses of this investigation, and concludes with comments on the implications of these findings and recommendations for future research.

The generally negative results of this investigation have undoubtedly been influenced by methodological issues related to procedure, design, and measurement. In addition, the major theoretical assumptions contained within this study bear re-examination, in an attempt to determine the role they may have played in the generally negative findings. In this author's opinion, the two factors that may have primarily contributed to the non-confirmatory findings are (a) the manner in which participants were categorized as either task or people oriented, and (b) the premise that such individuals would differentially respond to a computerized guidance system. These two issues will be discussed first, followed by a number of additional potentially confounding factors.

As discussed in the section on Holland's Theory, there appears to be no consensus among researchers concerning the manner in which "types" are determined based on VPI results. The Kivlighan et al. (1981) study, upon which the present study was loosely based, relied solely on primary codes (i.e., the highest raw score among the six types). The results, as previously discussed, support the notion of matching vocational treatment approaches and client

personality types. Such a classification by high-point code alone appears to be the favored procedure by researchers. However, other coding procedures have appeared in the literature. For example, Cox and Thoreson (1977) defined a VPI "single high-point code" as any code 10 percentile points or 4 raw score points higher than any other code. These authors excluded from participation any subjects whose profile did not meet these criteria.

A review of the literature by this author revealed no compelling argument for or against any particular method of classification. Holland claims that his early validation studies "are characterized by the use of multiple dependent variables and multiple methods for the definition of types" (1985, p. 59); many of which employed the same high-point code classification used in the present study. In fact, those studies that take into consideration Holland's notion of "differentiation" generally disregard the proximity of secondary and tertiary codes.

Differentiation is generally operationally defined as the arithmetic difference between the highest and lowest scores on the six occupational scales of the VPI or Self-Directed Search (although other formulas have been used) (Lowe, 1981). So, for example, the two following profiles would result in identical differentiation scores of 12: R=13, I=12, A=12, S=12, E=12, C=1; and R=13, I=1, A=1, S=1, E=1, C=1. The scores of 12 suggest equally high levels of differentiation despite the obvious quantitative

differences in the two profiles. Thus, it would seem that high-point codes, in one context or another, are the favored method of determining Holland's typologies. Admittedly, however, this does not speak to the validity (only the popularity) of such a method.

In clinical use, a VPI interpreter would certainly take a client's entire profile into consideration, rather than simply focusing on the primary code. In the above two RIASEC profiles, the two "Realistic" individuals differ drastically in their expressions of occupational interests. However, in the scoring system employed in the present study, both would be categorized as "task oriented." This method also ignores the individual's total number of "Yes," "No," or "Indifferent" (no marks) responses. For example, the following two individuals would be classified as "task oriented:" R=14, I=10, A=11, S=8, E=9, C=12; and R=1, I=0, A=0, S=0, E=0, C=0. The first individual found 64 of the 84 occupations interesting or appealing, the second individual only 1 of 84. Although he originally proposed that people resembled one type largely to the exclusion of others, Holland later suggested that, whereas one type usually predominates, second and third types often contribute to the individual's overall make-up (Weinrach, 1984).

Several explanations can be offered for why the majority of researchers, this author included, use only the primary code in career-related research. First, there appears to be no empirical evidence to suggest against its

use. Second, it results in a higher percentage of usable participants than other more discriminating methods. Third, it is extremely easy to determine one's primary code. Fourth, it appears to be the favored method of classification in previous investigations. Admittedly, these four explanations are hardly sufficient justification for the use of primary codes alone.

Fifth, and perhaps most importantly, is the fact that no trait-factor approach can ever hope to take into account all possible variables and contingencies. For example, whereas strong arguments could be made for including differentiation and/or consistency in the typological classification, one could also recommend the inclusion of any number of equally credible independent variables (e.g., number or percentage of "Yes" responses - which purports to provide clues into the nature of one's indecisiveness, congruence with college major, sex, age, grade point average, etc.).

It could be argued that excluding Holland's other "key concepts" is an example of pragmatism superseding scientific rigor. Conversely, however, little empirical support appears to exist for the use of differentiation and consistency in career counseling outcome research (see Holland's theory section). The relative simplicity and "elegance" of Holland's theory has undoubtedly contributed to its acceptance in applied and research settings. However, those very qualities may lend themselves to

simplistic and/or questionable applications in counseling and research efforts.

Kazdin (1980) claims that the "primary task of research design and the goal of a given experiment" is "minimizing ambiguity" (p. 4). It would certainly be desirable for the career counselor or researcher to be able to (non-ambiguously) categorize people, with 100% accuracy and confidence, as "task" or "people" oriented. But even if this unlikely task was achieved in the present study, it does not address the influence and interaction of potentially confounding variables. As Kazdin also states, "The better an experient is designed, the fewer the alternative plausible explanations that can be advanced to account for the findings" (p. 3). Thus, perhaps in an attempt to "minimize ambiguity" by dichotomously classifying people as task or people oriented based on their responses to a brief interest inventory, this author may have been guilty of (a) failing to design the experiment so as to minimize confounding explanations, and (b) oversimplifying complex human characteristics. However, a review of the extant research reveals that these shortcomings are in no way unique to the present study.

This leads to the second major proposed explanation for non-confirmatory findings - that the central premise of the study is flawed. That is, given that task and people oriented individuals do in fact exist (and were correctly identified in the present study), their reaction to SIGI may

have been incorrectly predicted. Because SIGI is structured, mechanized, and does not involve human interaction, it was hypothesized that the program would not appeal to, and would be less effective with, people oriented users. However, several possible flaws in this reasoning can be identified.

First, unlike other "inanimate objects" (e.g., books, appliances, tools, mechanical devices, etc.), later generation CACGS are interactive. They differentially respond to user input by providing individualized feedback. The user knows that his or her interaction is uniquely geared to his or her responses. The output on screen and paper is "personalized." It is not uncommon to hear college students complaining of the "depersonalization" of college and university life. SIGI, although non-human, is individually geared - a uniquely individualized guidance approach in an increasingly "depersonalized" environment.

At the risk of belaboring this point, it is also noteworthy that SIGI is infinitely "patient." If, as some SIGI users have reported, they feel rushed while using SIGI, this is a function of time constraints imposed by humans rather than the program itself. In addition, SIGI was designed to be "user friendly," containing instructions and procedures that are easily followed. Perhaps the people oriented individual is more predisposed toward these positive "human" qualities (interactivity, individualistic attention, patience, and "user friendliness") than to the

simple presence of another human being.

Secondly, the characteristics of task and people oriented individuals may have implications that confounded the findings of the present study. For example, Holland (1985) reported that high vocational aspirations are positively associated with the types in the following order: Enterprising, Social, Artistic, Investigative, Conventional, and Realistic. Thus, people oriented individuals' higher vocational aspirations may have influenced their use and reactions to SIGI to a greater extent than their social orientation. Future studies should attempt to "partial out" the potential influence of vocational aspirations in its participants.

Finally, the activities encompassed in SIGI may hold more appeal to people oriented than task oriented individuals. Recall that SIGI requires a considerable amount of self-exploration and values clarification. Whether involved with a human or a computer, the former group may react more favorably to such activities than the latter group. Thus, the self-examining activities involved in SIGI, rather than their mode of presentation, may differentially influence user reactions.

In this author's opinion, these two factors (the method of assigning types, and the major assumptions concerning these individuals' reaction to CACGS) underlie the generally negative findings. The following issues may have influenced the study's outcome as well.

Procedural Issues

Several procedural difficulties arose that were either unanticipated or seemingly insoluable. As previously discussed, 35 participants did not complete the required materials, rendering their data unusable. This is unfortunate because, in addition to the loss of potentially valuable data, it is possible that such "noncompleters" possessed personality characteristics of potential importance to this study. For example, noncompleters may have been dissatisfied with SIGI. Their failure to follow instructions may have reflected this dissatisfaction. Another possible explanation is that such people who fail to follow instructions may be poor candidates for CACGS use, which involve rather methodical and uniform procedures.

An attempt was made to determine if differences existed between completers and noncompleters regarding eight variables (sex, race, age, college class, previous CACGS use, orientation, pre-SIGI career decisiveness, and concurrent contact with a career counselor). A non-statistical comparison (see Table 6) reveals no apparent differences between completers and noncompleters among these variables. This list is not comprehensive ofcourse (it does not include any of the three dependent variables), and does not suggest that other differences may not exist.

In addition, participants were questioned to determine if they were simultaneously receiving career counseling

elsewhere (see SIGI User Information Form, Appendix B, Question #12). Of those who responded, 73% indicated that they were not currently seeing a counselor about career-related issues. Of the 27% who were seeing counselors at that time, approximately 80% indicated that they had seen the counselor only once. Therefore, it would appear that the great majority of SIGI users in the present study had received little or no career counseling immediately prior to, or during, their use of SIGI. No relationship was found to exist between contact with a counselor and orientation (See Table 4).

To further determine if exposure to a career counselor may have influenced the results of the study, participants' mean scores on the three dependent variables were compared on the basis of whether or not they were concurrently seeing a career counselor (see Table 3). The two groups did not differ in terms of time or SIGI evaluation scores. However, it was found that participants who were not seeing counselors were more indecisive following the use of SIGI than those simultaneously in contact with counselors. This finding supports the notion that a CACGS is more effective in conjunction with career counseling, than as a "stand-alone" intervention. It also suggests that greater efforts should have been made to control for this seemingly meaningful independent variable. Realistically however, career counseling and information come in many forms and from many sources (e.g., from academic advisors, friends,

parents, library resources, etc.). In a large university setting, it is unlikely that any screening procedure could assure that a CACGS (or any career counseling intervention) represents the participants' sole source of career guidance or information. The same would be true of any control group members that are included in any such research design.

On a more positive note, participants in the present study may not have represented the oft-criticized "volunteer personality" common to many counseling outcome studies. These students were not motivated by externally imposed conditions such as college credit, money, course requirements, etc. Instead, they independently and voluntarily sought the treatment, a fact that increases the study's generalizability to other college career counselees.

The fact that 71% of the participants were female can be viewed in two ways. It is known that female college students are more likely than their male counterparts to volunteer for psychologically-oriented research (Rosenthal & Rosnow, 1975). However, as previously discussed, it has been found that female college students pursue career counseling and use CACGS in greater percentages than male college students. Thus, the female majority in the present study likely portrays a typical CACGS user group, rather than necessarily representing a "volunteer personality" artifact.

Nonetheless, it is interesting that the comparison MSU SIGI user group consisted of a smaller percentage of females

(60%) than this study's participant (71%) and non-completer (74%) groups. Females completed and failed to complete the forms in similar percentages (71% vs. 74%, respectively). The same is true for males (29% vs. 26%, respectively). Thus, there is little basis for the argument that, among those who voluntarily sought the use of SIGI, females were more amenable to participation in the study than males. No explanation for this discrepancy is readily apparent, although it is likely that a larger sample size would have resulted in female-male percentages closer to those existing in the larger comparison group.

The fact that the participants agreed to use SIGI distinguishes them from the general "career client" population. Such CACGS volunteers are more likely than a randomly assigned group of individuals to have high expectations prior to SIGI use. This may partially account for the generally favorable ratings in this and virtually all other studies, and the general increase in decidedness scores. Some of the participants, aware that their responses were being recorded, may have tried to please the investigator by responding in a manner they deemed desirable. Thus, in this, as in many such investigations, the findings may have been confounded by the researcher's inability to determine if the results were due to the treatment or to the effect of demand characteristics. Largely because of this, a behavioral dependent variable (time spent on SIGI) was included in the study.

Design Issues

Although causal inferences can not be drawn from correlational research, such a method can lead to the discovery of possible causal relationships which may then become the subject of experimental investigation (Wood, 1983). The oft-cited major shortcoming of the one-group pretest-posttest design is the investigator's inability to evaluate whether or not the treatment is related to performance on the dependent measure.

Two of the present study's three criterion variables (time spent on SIGI, and SIGI evaluations) required the use of SIGI, and therefore were not subject to control group comparisons. Only post-SIGI level of career decisiveness could have been compared to control members' Career Decision Scale (CDS) scores over an equivalent period of time. Although no control group existed in the present study, numerous CACGS investigations have demonstrated significant differences between CACGS users' and control group members' post-CACGS level of career decidedness and/or career maturity (Chapman et al., 1977; Myers et al., 1975; Pinder & Fitzgerald, 1984; Pyle & Stripling, 1976). There also exists substantial empirical evidence demonstrating the CDS's sensitivity to career counseling interventions (Osipow, 1980). Therefore, although the existence of a control group would have been preferable, there remains substantial evidence to suggest that pre-post changes in the

Career Decision Scale scores were largely a result of the intervention rather than other "sources of invalidity" (Stanley & Campbell, 1966).

Previous studies employing control groups would suggest that the act of completing the CDS prior to a career counseling intervention does not result in a "practice effect" which may contaminate the responses to the post-intervention CDS. Likewise, the nature of the CDS scoring procedure guards against the occurrence of "instrumentation" as an additional "uncontrolled rival hypothesis." In addition, the short-term nature of this intervention eliminates the potential influence of "maturation" on pre-post scores. Therefore, it is safe to assume that these three potential confounding variables did not influence nor account for this study's generally negative findings.

Campbell and Stanley (1966) point out that statistical regression is a particular problem in one-group pretest-posttest designs when the participants are selected for their extremity. No such selection procedure occurred in the present study. A large variance existed among the participants' pre-treatment levels of career decisiveness. This is not to suggest, however, that a regression effect could not have partially accounted for some pre-post change scores in the present study.

Measurement Issues

The rationale for the classification of Artistic participants according to their secondary codes appears in the Methodology section. This procedure, to the best knowledge of this author, has no precedent in the literature. A non-statistical comparison was done between task and people oriented participants' dependent variable scores when the Artistic types' secondary codes were included and excluded. No differences appear to exist among the groups' mean scores (see Table 5). Nonetheless, because of the unknown validity of such a procedure, its elimination could only serve to enhance the tenability of such a classification procedure.

Similarly, the reasons for excluding differentiation and consistency in the present study appear in the Methodology section. Because of the reasons listed, no attempt was made to distinguish participants according to their profiles' degrees of differentiation or consistency. It is noteworthy that any such procedure would have resulted in the elimination of the majority of participants, rendering the results virtually meaningless. For example, only 18% (8 of 44) of the people oriented participants' profiles would qualify as "well differentiated" when a highest-minus-lowest cut-off score of 5 is used (a "moderate" level of differentiation, at best). Although a comparison could be made between poorly, moderately, and

highly differentiated individuals, there simply is not enough empirical support to justify such a procedure.

Although consistency was also excluded from the analyses, the classification of participants as "Pure SE's" (primary and secondary code of Social and Enterprising, in either order) demonstrates a recognition of the potential importance of code consistency within participants' profiles. As is discussed in the following section (see Suggestions for Future Research), a larger sample size would have allowed for the inclusion of differentiation and consistency in the analyses.

The CDS is a reactive measure, and thus subject to the potential shortcomings inherent to such instruments. The very act of completing such a scale may influence an individual's attitude toward his/her career decisiveness, identity, exploratory behaviors, etc. However, its proven sensitivity to changes resulting from career counseling interventions, as well as its acceptable psychometric properties, support its use as a dependent measure in such a study.

The amount of time spent on SIGI served as a less reactive measure of clients' attitude toward and use of the system. It is unlikely that a participant would have invested an extra hour or two on the system merely to please the experimenter. It is possible, but seemingly unlikely, that some participants may have purposely over- or under-reported their usage time. Nonetheless, the manner in

which usage time was ascertained was less than ideal. Some people failed to indicate the amount of time spent on the system. In addition, there exists the possibility of inaccurate reporting of time. Schedules were checked on a random basis to determine if students were recording more time than was available to them. No such discrepancies were discovered. However, this did not guard against students reporting more time than they had actually used. For example, a student with a two hour appointment may only have used the system for one hour, but recorded two. There is no strong reason to believe students may have done so, although the aforementioned demand characteristics might help to explain its possible occurrence. By relying on self-report, this intended nonreactive measure took on the potential for reactivity in some cases. Although the receptionists were requested to record time of usage, this practice discontinued almost immediately upon onset of the study.

The intention of examining the relationship between the reactive measures (decisiveness scores and SIGI ratings) and time spent on SIGI, was to better determine the credibility of all three dependent variables. The findings, which revealed significant positive relationships between time and ratings, and time and degree of decisiveness, support the notion that meaning can be derived from an examination of the amount of time spent on SIGI. However, as is the case with all the correlational findings reported herein, no causal inferences can be drawn. For example, the positive

relationship between time and ratings permits several interpretations: (a) To reduce cognitive dissonance, a person who spends a lot of time on SIGI may report having enjoyed and profitted from it, regardless of his/her true attitude and benefit; (b) Students who spend a lot of time on tasks may also tend to perceive those activities in a more favorable light; (c) Students who rush through the system may be reflecting a harried, frenetic disposition, and a related tendency toward displeasure and dissatisfaction toward things and events in general; (d) Students who spend more time on SIGI are those who need it more, and as such have a greater personal stake in its use and evaluation. These and other possible interpretations acknowledge the tentativeness with which all correlational findings must be treated.

Another shortcoming related to the present study's examination of time relates to the differential use of that time. For example, some psychotherapy clients make excellent use of long-term therapy, whereas others maladaptively prolong treatment. An assumption of the present study was that SIGI is used optimally when used in its entirety and/or in an unhurried fashion. However, this is not to suggest that the longer the use, the greater the benefit. And relatedly, this ignores the manner of use. One four hour user may divide the time evenly among the five subsystems, whereas another might skip quickly to a later subsystem. Neither pattern is necessarily desirable nor

undesirable, but rather a function of the user's attitudes and/or needs. For example, one hour on the STRATEGY section alone may be all a highly vocationally decisive individual requires. For a less decisive person, such a practice would undoubtedly be premature and insufficient.

Ideally, the time spent on each of the system's five subsections should have been separately examined to determine any significant patterns of use or preference. For example, it is reasonable to hypothesize that certain types of individuals spend more time on certain subsystems than others. For example, Social and Enterprising types may invest greater time and energy on the Values subsystem than Realistic and Investigative types.

The two criticisms most often cited about the use of CACGS evaluation devices as dependent variables in such studies are their dubious or unknown psychometric qualities, and their ultimate meaning. The first criticism was addressed in the present study. In an attempt to provide evidence of content validity, the investigator-created SIGI Evaluation Questionnaire was written with items relevant to the system's content, and supplied by the Educational Testing Service and MSU's career counselors. Slight yet statistically significant positive correlations were found with two other related dependent variables, thus supporting its concurrent validity. Also, a test of internal validity which resulted in a Coefficient Alpha of .88, demonstrated acceptable reliability.

The second criticism was only partially addressed. Correlations such as those examined in the present study provide added meaning to user ratings. CACGS rating tools such as this may in fact be reliable, and may be measuring that which they purport to measure. But there is some question among authors in the field regarding the meaning and importance of ratings. Psychotherapists have long known that it is not sufficient for clients to merely like their therapists and treatment. Such could also be said regarding teaching and the provision of medical services. One could enjoy an intervention and not benefit from it, or dislike yet profit from it. Why then do CACGS studies, the present one included, stress the importance of user ratings? There are several possible explanations:

1. Positive ratings, although not sufficient, are likely necessary to CACGS's survival. If CACGS are found to be effective in achieving their particular goals (e.g., decreasing indecisiveness, supplying up-to-date information, clarifying career-related values, etc.) but are somehow aversive to users, they would likely disappear from use. If enjoyable and effective, CACGS will undoubtedly proliferate. Because it is more easily demonstrated, researchers have likely focused on the former rather than the latter.

2. Many CACGS researchers seem unclear about the purpose of CACGS and therefore do not know what to measure in order to determine their effectiveness. Ratings are easily obtained and analyzed. Furthermore, practitioners

more than likely need some justification for the initial substantial expenditure involved in CACGS purchases and implementation.

3. Evaluation studies generally obtain positive ratings. The initial CACGS studies were undertaken or supported by CACGS developers who had an obvious vested interest in results demonstrating favorable user reactions.

4. College students are generally reluctant to seek career services (Brooks & Hagler, 1984). Although there are undoubtedly many reasons for this, positively rated services such as CACGS can only serve to decrease that historic reluctance.

5. It is often reported that counselors dislike engaging in career counseling activities. They may be more receptive to career counseling if a procedure exists that clients clearly enjoy, and which simultaneously decreases the counselors' active participation in career-related activities.

Although all of the above may have influenced the inclusion of SIGI evaluations in the present study, the nature of that examination differed from previous investigations in several ways. First, attempts were made to substantiate the psychometric qualities of the rating instrument. Second, the measure was compared to related dependent measures. Third, the interaction between ratings and raters' personal traits was examined. The failure to discover such interactions between ratings and user

characteristics may reflect the absence of any such existing relationship. The same could be said about the present study's failure to demonstrate a relationship between user traits and the two other dependent vriables: post-SIGI career decisiveness and time spent on the system. Before drawing such conclusions however, many of the deficiencies of the present study require correction. Such potential improvements appear in the following section.

Suggestions for Future Research

It has been suggested herein that the two primary reasons for the generally negative findings in the present study may have been (a) the manner in which SIGI users were classified according to Holland's occupational types, and (b) possible flaws in the central attribute-treatment interaction premise. In order to conclude that the latter is true, the former issue, as well as other reported shortcomings, require correction.

Studies such as the present one which involve the subclassification of participants according to various psychological and demographic traits, require a larger sample size than was achieved in the present investigation. A larger sample size allows the inclusion of more independent variables in the multiple regression equation, and increases the power to detect significant effects.

In addition, a larger N would allow the investigator to

be more discriminating when classifying individuals according to Holland's types. For example, the task and people orientation schema could be replaced by the six Holland types, a more familiar research procedure. Much could be learned by separately observing the correlations between all six types and the numerous proposed independent and dependent variables. This would also serve to eliminate the practice of classifying Artistic individuals according to their secondary occupational codes. A larger sample size would also allow for the elimination, or separate analysis, of participants with poorly differentiated profiles. Thus, for example, one could compare "Pure E's" with "Pure I's" with Pure C's," etc.

As discussed in the Procedures section, the present study was originally designed as a pretest-posttest control group design, but control participants proved unobtainable. Optimally, attribute-treatment interaction studies should involve two or more treatment groups, in addition to a control group. It would be desirable to have one SIGI group and one less structured, more interpersonal career counseling treatment group. Participants could be classified as people or task oriented, with half of each assigned to one of the two treatment groups. SIGI would be considered the task-oriented intervention, the group treatment representing the people-oriented intervention. Control group members' pre- and post-treatment CDS scores would be compared to the treatment members' scores. As in

the aforementioned Melhus et al. (1973) study, it would be hypothesized that people in attribute-consistent treatments would benefit more than those in attribute-inconsistent treatments.

The interaction between CACGS and numerous other relevant personal attributes should be examined. For example, pre-CACGS expectations and attitudes undoubtedly influence students' use of, and reaction to the programs. Also, students should be classified according to reasons for use; for example, too few or too many career options, need for career information, desire to confirm present choice, etc. It may be discovered, for example, that CACGS are particularly helpful for students needing to limit their choices, but less helpful for those wanting to expand their options.

A largely overlooked area of research involves the impact of pre-CACGS orientation procedures and/or post-CACGS debriefing sessions. Both procedures have an intuitive appeal, but little is known about their value or influence upon the use of CACGS. Sharf (1984), in a similar manner, compared user reactions to the same program (Exploring Careers) with and without the inclusion of occupational information. He found no significant difference between the two groups' ratings. If in this case it is found that orientations and/or debriefings fail to enhance the value of the systems, their practice could be altered or eliminated. Conversely, if they are shown to facilitate CACGS use, their

inclusion would be warranted. Surprisingly, many of the existing CACGS studies have paid little or no attention to the potential influence of such orientation and debriefing sessions that were included in the treatment.

The present study demonstrated the advisability of using the systems' internal programming to obtain data that is presently obtained obtrusively and inefficiently by paper-and-pencil means (e.g., time spent on the system, subsystems used, number and type of occupational titles and descriptions requested, interest inventory results, etc.). Having the questionnaires appear on the screen rather than on separate forms would be a highly efficient means of procuring information. The data could then be automatically compiled internally.

The examination of the process of SIGI use, rather than solely the outcome, has important ramifications for subsequent research. Whereas previous research has focused on how people react to CACGS, subsequent studies should examine how people use the systems. Data from the present study, although not reported herein, are available regarding differential reactions to SIGI's five subsystems. The first eight items in the SIGI Evaluation Questionnaire relate to one of the five subsystems, and thus the interaction of demographic and personal traits is subject to examination. Unfortunately, the time spent on the five subsystems is unavailable in the present study.

As is often suggested in the literature, the design of

the present study would have been strengthened by the inclusion of behavioral, nonreactive and longitudinal outcome measures, such as visits to a career information center, use of career resources, number of college major changes, post-CACGS grade point average, level of satisfaction with college, etc.

To summarize, it is recommended that future research (a) include larger numbers of participants, (b) alter the manner in which participants are classified according to Holland's typologies, (c) employ two or more treatment groups in addition to a control group, (d) include additional relevant independent variables, (e) study the potential influence of orientation and/or debriefing procedures, (f) employ the computer's internal programming for the procurement of data, (g) focus upon the process as well as the outcome of CACGS use, and (h) examine more behavioral and longitudinal variables.

APPENDICES

APPENDIX A

CONSENT FORM

Appendix A

Dear SIGI User:

We are very interested in evaluating the effectiveness of SIGI and learning more about the students who use the system. The information which you and hundreds of others supply us with will better enable us to provide quality career services to MSU students. Please take a few minutes to complete this Consent Form and the three additional questionnaires. When you are done with SIGI, you will be asked to complete two more brief questionnaires. Your use of SIGI will not be altered in any way, and you will not be contacted after you complete the questionnaires. Thank you for your participation.

CONSENT FORM

I understand that the study being conducted by Alan Farber, in conjunction with the MSU Service Learning Center, is for the purpose of examining personal, vocational and demographic characteristics of SIGI users. I also understand that participating in this study will not result in direct benefits to me, and I can discontinue my participation at any time.

I understand that the information I provide will be kept strictly confidential. General results will be reported, but none of these will identify individual participants' results. I understand that only Mr. Farber will have access to the original data. I also understand that I will upon request receive a report of this study's general results, within the restrictions of confidentiality outlined above.

_____ _____

Signature Name

_____ _____

Student Number Date

For additional information contact:
Alan Farber, Ph.D. candidate
Counseling Psychology
4th floor Erickson Hall, Desk 13

APPENDIX B

SIGI USER INFORMATION FORM

Appendix B

SIGI USER INFORMATION

The following questions are designed to provide demographic information about student SIGI users. Where a number is supplied, you need only circle the appropriate number. Other items need to be completed by you in the space provided. Thanks.

1. What is your name?

2. What is your age (in years and months)?

3. What is your sex? (1) Female (2) Male

4. What is your race? (1) Asian American (2) Black (3) Caucasian (4) Hispanic
   (5) Native American (6) Other (specify)

5. What is your college major?

6. What is your college classification?
   (1) Freshman (2) Sophomore (3) Junior (4) Senior (5) Other (specify)

7. What is your overall grade point average (GPA)?

8. Have you ever used SIGI or another computerized career guidance system? (1) Yes (2) No

9. How much experience do you have with computers? (e.g., programming, word processing, spread sheets, etc.)
   (1) A lot (2) Some (3) Very little (4) None

10. How much time have you spent playing video games?
    (1) A lot (2) Some (3) Very little (4) None

11. How did you hear about SIGI?
    (1) Friend (2) Career Counselor (3) Teacher/Class
    (4) Resident Advisor (5) Academic Advisor (6) Advertisement

12. Which of the following is true of you, regarding your seeing a counselor about career-related issues?
    (1) I am currently seeing one on an ongoing basis.
    (2) I am not currently seeing one, but have in the past.
    (3) I have never seen one, but plan on doing so in the near future.
    (4) I have never seen one, and don't plan to do so in the future.
    (5) Other (specify)

APPENDIX C

CAREER DECISION SCALE

Appendix C

CAREER DECISION

Marathon Consulting & Press
P. O. Box 09189
Columbus, Ohio 43209 - 0189

Your Name _____ **Today's date** _____ **Your date of birth** _____

This questionnaire contains some statements that people commonly make about their educational and occupational plans. Some of the statements may apply to you; others may not. Please read through them and indicate how closely each item describes you in your thinking about a career or an educational choice by *circling* the appropriate number on the answer sheet.

If you are excited about going to work and feel no hesitation about it you would circle "4" as it is circled in the example on the next page to indicate the description was exactly the way you feel. If the item is very close, but not exactly the way you feel—for example, you're generally excited about going to work after you graduate, but are experiencing some minor concerns about it—you would circle the number "3". You would circle "2" if the item described you in some ways, but in general it was more unlike than like your feelings; for example, if you were generally more concerned than excited about work after graduation. Finally, you would circle "1" if the item did not describe your feelings at all; that is, you were experiencing a great deal of concern and no excitement about graduation and work.

An example is given below:

Sample Self-Description Item	Sample Answer			
	Exactly like me	Very much like me	Only slightly like me	Not at all like me
I am excited about graduating and going to work.	4	3	2	1

If you change your answer, please be sure that all previous marks are completely erased. Please give only one response to each item and respond to all items.

	CIRCLE ANSWER			
	Like Me			Not Like Me
1. I have decided on a career and feel comfortable with it. I also know how to go about implementing my choice.	4	3	2	1
2. I have decided on a major and feel comfortable with it. I also know how to go about implementing my choice.	4	3	2	1
3. If I had the skills or the opportunity, I know I would be a _____ but this choice is really not possible for me. I haven't given much consideration to any other alternatives, however.	4	3	2	1
4. Several careers have equal appeal to me. I'm having a difficult time deciding among them.	4	3	2	1
5. I know I will have to go to work eventually, but none of the careers I know about appeal to me.	4	3	2	1

REMEMBER — 4 is *exactly like me,* 3 is *very much like me,* 2 is *only slightly like me,* and 1 is *not at all like me.*

6. I'd like to be a _____, but I'd be going against the wishes of someone who is important to me if I did so. Because of this, it's difficult for me to make a career decision right now. I hope I can find a way to please them and myself.	4	3	2	1
7. Until now, I haven't given much thought to choosing a career. I feel lost when I think about it because I haven't had many experiences in making decisions on my own and I don't have enough information to make a career decision right now.	4	3	2	1
8. I feel discouraged because everything about choosing a career seems so "ify" and uncertain; I feel discouraged, so much so that I'd like to put off making a decision for the time being.	4	3	2	1
9. I thought I knew what I wanted for a career, but recently I found out that it wouldn't be possible for me to pursue it. Now I've got to start looking for other possible careers.	4	3	2	1
10. I want to be absolutely certain that my career choice is the "right" one, but none of the careers I know about seem ideal for me.	4	3	2	1
11. Having to make a career decision bothers me. I'd like to make a decision quickly and get it over with. I wish I could take a test that would tell me what kind of career I should pursue.	4	3	2	1
12. I know what I'd like to major in, but I don't know what careers it can lead to that would satisfy me.	4	3	2	1

REMEMBER — 4 is exactly like me, 3 is *very much like me,* 2 is *only slightly like me,* and 1 is *not at all like me.*

13. I can't make a career choice right now because I don't know what my abilities are.	4	3	2	1
14. I don't know what my interests are. A few things "turn me on" but I'm not certain that they are related in any way to my career possibilities.	4	3	2	1
15. So many things interest me and I know I have the ability to do well regardless of what career I choose. It's hard for me to find just one thing that I would want as a career.	4	3	2	1
16. I have decided on a career, but I'm not certain how to go about implementing my choice. What do I need to do to become a _____ anyway?	4	3	2	1
17. I need more information about what different occupations are like before I can make a career decison.	4	3	2	1
18. I think I know what to major in, but feel I need some additional support for it as a choice for myself.	4	3	2	1

APPENDIX D

VOCATIONAL PREFERENCE INVENTORY

Appendix D

THE VOCATIONAL PREFERENCE INVENTORY

Developed by John L. Holland, Ph.D.

This is an inventory of your feelings and attitudes about many kinds of work. Fill out your answer sheet by following the directions given below:

1. Show on your answer sheet the occupations which *interest* or *appeal* to you by blackening Y for "Yes."
2. Show the occupations which you *dislike* or find *uninteresting* by blackening N for "No."
3. Make *no marks* when you are undecided about an occupation.

---

1. Criminologist
2. Private Investigator
3. Restaurant Worker
4. Detective
5. Photoengraver
6. Truck Gardener
7. Physical Education Teacher
8. Humorist
9. Photographer
10. Diplomat

11. Airplane Mechanic
12. Meteorologist
13. Sociologist
14. Bookkeeper
15. Speculator
16. Poet
17. Deep Sea Diver
18. Stock Clerk
19. Dramatic Coach
20. Lawyer

21. Fish and Wildlife Specialist
22. Biologist
23. High School Teacher
24. Business Teacher
25. Buyer
26. Symphony Conductor
27. Wrecker (Building)
28. Veterinarian
29. Elementary School Teacher
30. Physician

31. Auto Mechanic
32. Astronomer
33. Juvenile Delinquency Expert
34. Budget Reviewer
35. Advertising Executive
36. Musician
37. Prizefighter
38. Post Office Clerk
39. Experimental Laboratory Engineer
40. Bartender

41. Carpenter
42. Medical Laboratory Technician
43. Speech Therapist
44. Certified Public Accountant
45. Manufacturer's Representative
46. Author
47. Firefighter
48. Airline Ticket Agent
49. Entertainer
50. Novelist

51. Power Shovel Operator
52. Anthropologist
53. Marriage Counselor
54. Credit Investigator
55. Television Producer
56. Commercial Artist
57. Wild Animal Trainer
58. Administrative Assistant
59. Physical Therapist
60. Cashier

61. Surveyor
62. Zoologist
63. School Principal
64. Court Stenographer
65. Hotel Manager
66. Free-Lance Writer
67. Stunt Man/Stunt Woman (Movies)
68. Route Salesperson
69. Professional Athlete
70. Flight Attendant

71. Construction Inspector
72. Chemist
73. Playground Director
74. Bank Teller
75. Business Executive
76. Musical Arranger
77. Jockey
78. Interior Decorator
79. Airplane Pilot
80. Banker

(Continued)

THE VOCATIONAL PREFERENCE INVENTORY (Continued)

81. Radio Operator
82. Independent Research Scientist
83. Clinical Psychologist
84. Tax Expert
85. Restaurant Manager
86. Journalist
87. Motorcycle Driver
88. Department Store Manager
89. Referee (Sporting Events)
90. Mail Carrier

91. Filling Station Worker
92. Writer of Scientific Articles
93. Social Science Teacher
94. Inventory Controller
95. Master of Ceremonies
96. Portrait Artist
97. Blaster (Dynamiter)
98. Police Officer
99. English Teacher
100. U.N. Official

101. Tree Surgeon
102. Editor of a Scientific Journal
103. Director of Welfare Agency
104. IBM Equipment Operator
105. Salesperson
106. Concert Singer
107. F.B.I. Agent
108. Probation Agent
109. Astronaut
110. College Professor

111. Long Distance Bus Driver
112. Geologist
113. Youth Camp Director
114. Financial Analyst
115. Real Estate Salesperson
116. Composer
117. Mountain Climber
118. Cook/Chef
119. Stage Director
120. Ticket Agent

121. Locomotive Engineer
122. Botanist
123. Personal Counselor
124. Cost Estimator
125. Publicity Director
126. Sculptor/Sculptress
127. Explorer
128. Nursery School Teacher
129. Quality Control Expert
130. Judge

131. Machinist
132. Scientific Research Worker
133. Psychiatric Case Worker
134. Payroll Clerk
135. Sports Promoter
136. Playwright
137. Test Pilot
138. Computer Programmer
139. Clothing Designer
140. Truck Driver

141. Electrician
142. Physicist
143. Vocational Counselor
144. Bank Examiner
145. Sales Manager
146. Cartoonist
147. Racing Car Driver
148. Forester
149. Social Worker
150. Sales Clerk

151. Funeral Director
152. Mind Reader
153. Architect
154. Shipping & Receiving Clerk
155. Criminal Psychologist
156. Insurance Clerk
157. Barber
158. Bill Collector
159. Ward Attendant
160. Masseur/Masseuse

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APPENDIX E

SIGI EVALUATION QUESTIONNAIRE

Appendix E

SIGI EVALUATION QUESTIONNAIRE

How useful was SIGI in accomplishing the following? (circle 1-4, per item):

1=Extremely Useful 2=Very Useful 3=Somewhat Useful 4=Not at all Useful

Helping you decide which occupation to prepare for. 1 2 3 4

Helping you become more aware of your values. 1 2 3 4

Showing you the relationship between values and career decisions. 1 2 3 4

Helping you find out which occupations might fit your values. 1 2 3 4

Helping you get information about occupations. 1 2 3 4

Helping you plan a program appropriate for an occupation you are considering. 1 2 3 4

Helping you learn how to make career decisions. 1 2 3 4

How interesting was SIGI to you?

____ Extremely ____ Very ____ Somewhat ____ Not at all

How clear was SIGI in providing information?

____ Extremely ____ Very ____ Somewhat ____ Not at all

How likely would you be to recommend SIGI to a friend?

____ Extremely ____ Very ____ Somewhat ____ Not at all

Overall, how would you rate SIGI?

____ Excellent ____ Good ____ Fair ____ Poor

How many total hours did you spend on SIGI? (please round off to the nearest quarter hour):

Over how many sessions did you use SIGI? ____1 ____2 ____3 ____4 or more

Are you currently seeing a counselor about career issues? ____ Yes ____ No

If yes, how many times have you seen him/her since you began using SIGI?

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