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AUTHOR Oliver, Laurel W.
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ABSTRACT

The topic of career counseling outcome measures was reviewed to provide background for the construction of instruments used in evaluating a computer-based career information and planning program for Army officers. An extensive literature review of research from 1950 to 1976 provided the basis for classification of career counseling outcomes. Issues emerging from this review included the following: (1) use of inappropriate criteria; (2) the tendency on the part of career counseling researchers to "reinvent the wheel" instead of building on each other's work; (3) a preponderance of self-report measures rather than measurement approaches; (4) relative infrequency with which validity or reliability data are reported for the instruments used; and (5) methodological shortcomings concerning subject randomization, selection of appropriate comparison issues, and choice of type of statistical analysis. Although originally written for an Army project, this report can be used by career counseling researchers as a tool for selecting outcome measures. Numerous tables delineating the study, criterion or variable, and measurement procedure are provided for the user. (Author/HLM)

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Technical Paper 316

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OUTCOME MEASURES FOR CAREER COUNSELING RESEARCH

Laurel W. Oliver

CAREER DEVELOPMENT & SOLDIER PRODUCTIVITY TECHNICAL AREA

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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WILLIAM L. HAUSER
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Commander

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This paper reviews the topic of career counseling outcome measures. The purpose of the review is to provide background for the construction of instruments used in evaluating a computer-based career information and planning program for Army officers. After a discussion of general considerations concerning the selection of dependent variables for outcome research, the most frequently used measures are summarized. Some of the salient issues that have emerged from the career counseling outcome research also are discussed, and specific recommendations are made for career counseling outcome researchers.

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Technical Paper 316

OUTCOME MEASURES FOR CAREER COUNSELING RESEARCH

Laurel W. Oliver

Bertha H. Cory, Work Unit Leader

CAREER DEVELOPMENT & SOLDIER PRODUCTIVITY TECHNICAL AREA

Submitted as complete and technically accurate, by:
Cecil D. Johnson
Technical Area Chief

Approved By:

E. Ralph Dusek, Director
INDIVIDUAL TRAINING AND PERFORMANCE RESEARCH LABORATORY

Joseph Zeidner
TECHNICAL DIRECTOR (DESIGNATE)

U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES
5001 Eisenhower Avenue, Alexandria, Virginia 22333

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Career Progression Systems

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FOREWORD

An important part of the research of the Career Development and Soldier Productivity Technical Area of the Army Research Institute for the Behavioral and Social Sciences (ARI) supports effective career management for Army officer personnel. As part of this concern for effective career management, ARI is conducting research on a computer-based career information and planning system for Army officers. This report reviews the types of outcome measures previously used in career counseling research. The immediate purpose of the review is to provide background for the construction of instruments to evaluate a computer-based career information and planning system for Army officers. Other related reports include ARI Research Memorandum 77-13, which provides an overview of career development theory, and Research Memorandum 77-14, which describes a field tryout of the computer-based career information and planning system. Continuing investigations center on cost-benefit analyses of the system. This research is conducted under Army Project 2Q762717A766, Manpower Systems Management (FY 78); Task C, Career Progression Systems, in basic support of the Office of Deputy Chief of Staff for Personnel. Dr. John O. Crites and Dr. Clara Hill provided comments on this paper.

JOSEPH ZEIDNER
Technical Director (Designate)

OUTCOME MEASURES FOR CAREER COUNSELING RESEARCH

BRIEF

Requirement:

To provide background for constructing outcome measures (that is, measures of the effect of counseling) to evaluate a career information and planning system for Army officers.

Procedure:

Previously used career counseling outcome measures (1950-76) were classified and reviewed, and issues emerging from the review were discussed. A set of recommendations for future career counseling outcome research addresses these issues.

Findings:

Career counseling researchers have demonstrated a tendency to "reinvent the wheel" instead of building on each other's work. A critique of previous career counseling research revealed the following: (1) use of inappropriate criteria; (2) preponderance of self-report measures, as contrasted to the use of measurement approaches such as cost benefit analysis or behavioral observation; (3) relative infrequency with which reliability and validity data are reported for the instruments used; and (4) methodological shortcomings concerning randomization of subjects, selection of appropriate comparison groups, and choice of type of statistical analysis. Although much of the career counseling outcome research has been characterized by one or more of these inadequacies, there are many examples of good outcome measurement in the literature. In addition, most published research demonstrates some useful procedure or conceptualization which would be helpful to career counseling researchers.

Utilization of Findings:

This report can be used by career counseling researchers as a resource in selecting outcome measures. The specific application is for constructing instruments for evaluating a computer-based career information and planning system for Army officers. The report, however, is expected to have broader application to other types of career counseling approaches, and the findings presented here are not intended to be limited to the Army officer system.

OUTCOME MEASURES FOR CAREER COUNSELING RESEARCH

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OUTCOME MEASURES FOR CAREER COUNSELING RESEARCH

INTRODUCTION

Placing people in the right jobs has been of increasing concern in both the civilian and military worlds. As stated in DA Pamphlet 600-3, Officer Professional Development and Utilization, objectives of the Officer Personnel Management Systems are to:

1. Develop officers in the right numbers and with the right skills to satisfy Army requirements, taking maximum advantage of inherent abilities, aptitudes, and interests of the individual officer;

2. Assign officers according to the Army's needs and the individual's competence and desires; and

3. Improve the motivation and professional satisfaction of the officer corps.

One way of implementing these objectives is to study the officer career progression system and design interventions that enhance the career development of Army officers. Such research has been undertaken by the Career Progression Systems Work Unit of the Career Development and Soldier Productivity Technical Area at the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI). Now underway is development of a computer-aided career planning program to teach officers career decision-making skills and also provide relevant career information.[1]

In evaluating any career development program such as described above, decisions must be made concerning which of a multitude of dependent variables are to be used. The decision must be made on which variables are best suited for evaluating that particular program and population. Therefore, the purpose of this paper is to provide a review of the types of measures previously used to evaluate career counseling outcome research in order to provide background for a specific application: constructing instruments for evaluating a computer-based career information and planning system for Army officers. However, these issues are considered in the broader context of the working world, and the findings presented here are not intended to be limited to the Army officer system.

The discussion begins with some general considerations bearing on selecting dependent variables for outcome research, and a summary of the most frequently used measures follows this discussion. Next, some issues

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[1]The author wishes to express her appreciation to Dr. John O. Crites and to Dr. Clara Hill for their helpful comments on this paper.

that have emerged from the career counseling outcome research are described. Finally, recommendations for resolving some of the problems of outcome measurement are considered.

GENERAL CONSIDERATIONS

Several general factors need to be considered in deciding which of many dependent variables are to be selected for career counseling outcome research. One such factor involves the type of behavior to be assessed. What are the behaviors? Are they short-range or long-range in nature? Must we rely on self-report, or are unobtrusive measures practical? In addition, where are these behaviors to be observed? Will this observation be conducted in the field, in the laboratory, or through a mail survey? The location may impose limits in terms of the available sample, whether randomization is possible, etc. Where the research will take place may also influence consideration of when it can occur. Timing may control the number and type of researchers and instruments to be used, as well as the possibility of followup studies. How these behaviors are to be observed is also an important consideration, which relates to decisions about the behaviors selected and where and when the observations are to be made. What is the availability of current instruments (human observers as well as paper-and-pencil instruments)? Do instruments of proven reliability and validity exist, or must they be constructed? Is the cooperation of potential observers or sources of information assured? To what extent are appropriate records obtainable?

Some of the specific factors involved in outcome measures have been mentioned in general terms of what, where, when, and how. It is the "why," however, that often determines what, where, when, and how the research is to be carried out. Objectives of a field test, for example, may differ from those of program evaluation. As Helliwell and Jones (1975) have pointed out, field tests are like "dress rehearsals"; that is, the main purpose of a field tryout is to "debug" the system. From their experience with evaluating a model for improving guidance programs, Helliwell and Jones (1975) made the following suggestions for field tests:

1. To investigate interim rather than terminal behaviors,
2. To use fewer and shorter evaluation instruments,
3. To keep very careful records (including anecdotal ones) concerning the difficulties encountered in conducting the test, and
4. To obtain strong assurance of cooperation and real involvement from people at the test site location.

However, if the purpose of the test is not merely to debug a system but to evaluate the efficacy of the system or to compare it with another system or systems, the approach may be somewhat different. In a critique of process and outcome research in counseling, Kelley, Smits, Leventhal,

and Rhodes (1970) concluded that the two major shortcomings of the 73 studies they reviewed were the failure to include control groups in the experimental design and the lack of randomization. In terms of the Campbell and Stanley (1966) classification system, most of the research reviewed by Kelley et al. involved one-shot case studies, one group pretest-posttest, or static-group comparisons--none of which constitutes a true experimental design.

Hilton's (1974) criteria for adequate evaluation of career education and guidance outcomes also emphasized random assignment to treatments. In addition, Hilton suggested pretest-posttest measurement, a representative sample, a sample large enough to obtain statistically reliable results, and an "objectively scored measure of relevant characteristics of known reliability and validity" (Hilton, 1974). The issue of reliability and validity of the instruments is an important one in career counseling outcome research, and the topic will be discussed in some detail later in this paper.

In this discussion of factors to be considered in selecting career counseling outcome measures, it has been suggested that the purpose of the research is of primary importance. The objectives to be accomplished will help the researcher determine which dependent variables are to be used. The references mentioned above are good background sources for investigators faced with the problem of selecting career counseling outcome variables.

In addition, Bingham's (1974) chapter on assessing counseling outcome may be helpful. Although the Bingham paper is primarily directed toward counselors concerned with career guidance and career education in schools, portions of his discussion are pertinent to any developmental career planning program. Another valuable (and more technical) source for the researcher interested in evaluation is the two-volume Handbook of Evaluation Research. The first volume (Struening & Guttentag, 1975) emphasizes strategies and methods of evaluation, whereas the second volume (Guttentag & Struening, 1975) focuses on evaluation in specific content areas.

SUMMARY OF PREVIOUSLY USED MEASURES

In a review of outcome research in educational and vocational counseling, Myers (1971) has classified dependent variables for educational-vocational decisionmaking and effective role functioning. For educational-vocational decisionmaking, dependent measures fell into three categories: accuracy of self-knowledge, appropriateness of career preference or choice, and instrumental behaviors. Variables related to effective role functioning were classified according to whether they were criteria of adjustment or performance.

Adapting the Myers classification system somewhat, this report discusses dependent variables for career counseling outcome research in terms of the following categories:

1. Career decisionmaking measures

   a. Accuracy of self-knowledge

   b. Appropriateness of choice

   c. Instrumental behaviors (career information seeking, securing job)

   d. Attitudes toward choice (certainty, satisfaction, commitment, career salience)

2. Effective role functioning measures

   a. Performance variables (academic performance, career-related knowledge)

   b. Adjustment variables (career maturity, self-concept changes)

3. Ratings of counseling satisfaction and effectiveness

4. Miscellaneous measures

To clarify the discussion that follows, a table is presented for each type of dependent measure enumerated above. For each study using that particular kind of measure, the table identifies the criterion or specific variable involved and describes briefly how the assessment was made. (The studies in Tables 1-8 cover the period 1950-76.)

Note that this paper is limited to career counseling outcome research. Research concerned only with educational counseling is not included. Also, the focus is on career counseling outcome variables, even though process and outcome cannot always be easily differentiated. In fact, Grummon (1972) has argued that process studies involving a series of measurements during the course of counseling are also outcome studies. Grummon would consider the trend line for an increase in self-acceptance, for example, an outcome measure. However, process variables such as client-counselor rapport, or the specific topics covered during a series of career counseling interviews, are not dealt with here. The discussion focuses on variables that assess the impact of career counseling after counseling has been completed (although, of course, pretest measures may be made in order to determine the change that has occurred during the period of counseling).

Also not included are studies that relate to career counseling outcome variables but that do not actually involve counseling. One such type of research comprises investigations of test score recall. Although these studies have typically used outcome measures, they are not included unless the test interpretation was part of a career counseling treatment.

Lastly, the summary of dependent variables used in career counseling outcome research is not intended to be an exhaustive compendium. Rather, the purpose of the summary is to describe the kinds of measures typically used in career counseling outcome research and to present some examples of each type.

Career Decisionmaking Measures

Career decisionmaking measures constitute the first major category of career counseling outcome variables. Four types of dependent measures are included: (a) accuracy of self-knowledge, (b) appropriateness of choice, (c) instrumental behaviors, and (d) attitudes toward career choice.

Accuracy of Self-Knowledge. Variables of this type assess the discrepancy between client self-estimates of a characteristic and a criterion, with the criterion consisting of a test score or a rating by judges. The usual self-estimate procedure involves (a) having subjects estimate their standing on the dimension of interest before any treatment (counseling) takes place, (b) obtaining similar estimates after counseling, and (c) determining the effect of the treatment by analyzing the pretest-posttest discrepancy (between self-estimates and criterion) and/or differences between experimental and control groups. Table 1 summarizes the studies that have included self-knowledge as a dependent measure.

Many career counseling outcome studies have used self-knowledge variables. Typical of such outcome research is an early study by Johnson (1953). In this investigation, male subjects were administered tests of scholastic aptitude (Otis), interests (Kuder), and personality (Bernreuter). Prior to seeing a counselor for an initial interview, the subject responded to a questionnaire on which he estimated in which fifth of the population he stood with respect to intelligence, interests, and personality. Immediately after treatment (vocational counseling), the subject again completed the questionnaire containing the self-estimates. In a 1-month followup, the subjects filled out the questionnaire for a third time. At the conclusion of the counseling, the subject's "true" standing on the various dependent variables was rated by his counselor, who used the test results in determining the rating.

As can be seen in Table 1, outcome studies using self-knowledge measures as dependent variables have tended to focus on self-estimates of interests and aptitudes. Measures of achievement and personality have been used less frequently. Most of the studies ask the subjects to compare others with themselves and estimate into which proportion (usually quintile) of the comparison population they would fall. A slightly different procedure was used by Guttman and Haase (1972), who had subjects estimate their three highest and three lowest (Kuder) interest areas.

Table 1

Self-Knowledge as Dependent Variable

Study	Criterion	Rating categories	Self-knowledge variables			
			Interests	Aptitudes	Achievement	Personality
Babcock & Kaufman (1976)	Test scores		"self-knowledge" (Career Development Inventory subtest adaptation)			
Berdie (1954)	Test scores	5-point scale	x	x		x
Dressel & Matteson (1950)	Test scores	Rating scale	"self understanding"			
Folds & Gazda (1966)	Test scores	5 categories (not quintiles)		x		
Foreman & James (1973)	Test scores	5-point scale	x			x
Forster (1969)	Test scores	Relative standing		x	x	
Froehlich & Moser (1954)	Test scores	Percentiles				
Gilbert & Ewing (1971)	Test scores	5-point scale	x	x	x	
Gustad & Tuma (1957)	Test scores	Relative standing "Graphic scales"	x	x		
Guttman & Haase (1972)	Test scores	3 lowest, 3 highest (interest areas)	x			
Holmes (1964)	Test scores	Stanines				
Johnson (1953)	Judges' ratings	Quintiles	x	x		x
Kamm & Wrenn (1950)	Judges' ratings	5-point scale	x	x	x	
Lister & Ohlsen (1965)	Test scores	5-point scale	x	x	x	
Pilato & Myers (1973)	Test scores	Quintiles	x	x		
Rogers (1954)	Judges' ratings	5-point scale	x	x		
Singer & Stefflre (1954)	Test scores	"Degree of interest"	x			
Wright (1963)	Test scores	Quintiles	x	x	x	

With few exceptions, the studies given in Table 1 used test scores as criteria. Three studies used judges' ratings as criteria. Even when judges' ratings were used, however, judges had had test data available to them. Johnson (1953), for example, explained that his counselors' judgments were "guided but not determined solely by the test results" (p. 333). Overwhelmingly, then, career counseling outcome research has depended on test scores, directly or indirectly, as criteria for client self-estimates.

In the Kamm and Wrenn (1950) study, a variant of the self-knowledge criterion was used. Using summaries of pre-interview and post-interview data, three judges rated client "acceptance" of test information.

Appropriateness of Career Choice. "Appropriateness" of career choice, sometimes termed "realism" or "wisdom," is another commonly used measure of career counseling outcome. Such variables are based on assumptions that individuals are better suited for some careers than others to a measurable degree of "appropriateness." The usual procedure is: (a) to assess the client's characteristics that are vocationally relevant, (b) to determine the requirements of the chosen career in terms of these characteristics, and (c) to estimate the degree of congruence between client characteristics and career requirements. Table 2 summarizes some of the research that has dealt with appropriateness as a dependent variable.

The most common method for determining whether a career is appropriate for an individual has been judges' ratings. Judges may make their ratings on the basis of case materials and have no contact with the subjects. Or the judges may be the counselors actually administering the career counseling and, thus, use interview data as well as the usual test information and questionnaire responses. Judges' ratings have been of various kinds. Some authors have used dichotomous ratings, such as realistic/unrealistic (Hewer, 1959; Hoyt, 1955; Wright, 1963). Other research has used scales that represented a degree of appropriateness from realistic to unrealistic (Apostal, 1960; Bivlofsky et al., 1953; Hewer, 1966; Mencke & Cochran, 1974; Westbrook, 1967). A few researchers (Hanson & Sander, 1973; Pilato & Myers, 1975) have constructed instruments ranging from one extreme of inappropriateness to another, with the midpoint representing an optimal degree of realism.

A typical study using appropriateness of choice as a dependent variable is that of Hanson and Sander (1973). In this research, three experienced counselors judged the subjects' "realism of vocational plans" on a 5-point scale that included the following categories: overshooting, moderately overshooting, realistic, moderately undershooting, and undershooting. Overshooting was defined as aspiring to an occupation that was beyond the person's ability level, and undershooting involved the judgment that the subject could probably succeed in a higher level occupation. Each judge was provided with aptitude, interest, and achievement test scores for the subjects as well as information on their grades, extracurricular activities, work experience, health, and family background. Hanson and

Table 2

Appropriateness as Dependent Variable

Study	Criterion	Procedure
Apostal (1960)	Judges' ratings (counseling psychologists)	Used data from followup questionnaire (education, job experience) and data from case record (tests, personal information, counselor's notes) to rate on 4-point scale (Inappropriate, Inappropriate-Borderline, Borderline-Appropriate, Appropriate)
Bivlofsky et al. (1953)	Judges' ratings (counselor-psychologists)	Used general background, school adjustment, and advisement-services data to rate on 3-point scale (realistic, doubtful realism, unrealistic)
Gonyea (1962, 1963)	Judges' ratings (psychologists)	Used test data to rate subject's choice on 6-point scale ("extremely appropriate" to "extremely inappropriate")
Hanson & Sander (1973)	Judges' ratings (counselors)	Dossier containing data on aptitude, interests, achievement, extracurricular activities, demographic information, etc., used to rate on 5-point scale (overshooting, moderate overshooting, realistic, moderate undershooting, undershooting)
Hewer (1959)	Judges' ratings (counselors)	Used test data, grades, and personal history form to rate (realistic/unrealistic) the probability that subject could complete training for career, that subject could succeed and remain in the job over a long period of time, and that employment opportunities were available for the job.
Hewer (1966)	Current occupation	Degree of similarity between job person currently in and that of vocational choice made following counseling 7 years earlier, using 5-point rating scale (no change, change but same type and level, change in type but not in level, change in level but not in type, change in level and type), with type based on amount of education and/or responsibility needed for the job.

Table 2

Appropriateness of Dependent Variable - Continued

Study	Criterion	Procedure
Hoyt (1955)	Judges' ratings (vocational counselors)	Used test data, grades, and personal history form to rate (realistic/unrealistic) the probability that subject could complete training for career, that subject could succeed and remain in the job over a long period of time, and that employment opportunities were available for the job
Mencke & Cochran (1974)	Test scores	Holland code of occupations being considered compared with Self-Directed Search (SDS) code of individual, resulting in an "ordinal congruency score" for each subject
Pilato & Myers (1975)	Test scores	Comparison of subject's aptitude and interests with Roe's level and field for occupation, ranging from one type of inappropriateness to another with the mean representing optimal appropriateness (pp. 64-65)
Westbrook (1967)	Test scores	Stanine score on SCAT compared with subject's level (0-9) of occupational aspiration as measured by Occupational Aspiration Scale (Haller & Miller, 1963)
Wright (1963)	Judges' ratings (counselors)	Appropriateness of subject's vocational choice rated "feasible" or "not feasible" in terms of "student's measured ability, interests, and achievements"
Zener & Schnuelle (1976)	Test scores	Ordinal index inversely related to probability of chance similarity (from table in SDS manual) used to compare degree of similarity between summary codes of occupations subjects were considering and subjects' summary codes from SDS or Vocational Preference Inventory

Sander (1973) also reported interjudge reliabilities, a practice not always adhered to in career counseling outcome research.

Although judges' ratings are the most frequently used means of assessing appropriateness of career choice, some authors have developed techniques that are objective in nature and avoid the problem of the reliability of such ratings. Zener and Schnuelle (1976) compared the Holland summary codes of occupations their subjects were considering with the subjects' codes obtained from the SDS or the VPI. Mencke and Cochran (1974) used the Holland codes for the career choice but compared them with the codes for the subjects' measured interests. Still another measure was used by Westbrook (1967), who compared aptitude scores with the aspiration level of the choice. Pilato and Myers (1975) quantified appropriateness in terms of the client's measured characteristics (aptitude and interests) and Roe's (1957) classification of occupations by level and field. As did Hanson and Sander (1973) in the study described above, Pilato and Myers took into account the fact that an aptitude level higher than that required for a job may be just as inappropriate as an aptitude level that is too low.

All but one of the studies reported in Table 2 used judges' ratings or test scores as the criterion. The single exception was a study by Hewer (1966), who used the current occupation of her subjects as a criterion.

Instrumental Behaviors. Almost all measures falling into the classification of instrumental behaviors involve career or educational information-seeking behavior. As shown in Table 3, the most commonly used dependent measures are frequency and variety of information seeking. The frequency variable involves a count of the total number of contacts made by the client to obtain career information, and variety is the number of different types of sources (libraries, counselors, etc.) the subject consulted. Self-report procedures are typically used with the data obtained by use of a questionnaire or a structured interview. An unobtrusive measure of information seeking was used by Cooper (1976), who recorded the number of subjects who returned to the counseling center to pick up career information after career counseling had been completed.

Almost all of the measures of information-seeking behavior appeared to be identical to or derived from those developed by Krumboltz and his associates. (Borman, 1972, and Samaan and Parker, 1973, were the only investigators who did not identify their questionnaires as being related to those used by Krumboltz.) Most of these procedures involved a structured interview such as that described in Krumboltz and Schroeder (1965). An interviewer who did not know which treatment the person had received interviewed each subject a few weeks after counseling. The interviewer followed a detailed questionnaire constructed to elicit reports of 21 categories of information-seeking behavior, such as reading books or magazine articles about careers, requesting an occupational pamphlet, talking to persons working in a particular occupation, watching TV shows or listening to radio programs about occupations, etc. Krumboltz and Schroeder (1965) also made a validity check of the interview data by attempting to verify

Table 3

Instrumental Behavior as Dependent Variable

Study	Criterion behavior	How measured
Borman (1972)	Variety of information seeking behavior	90-item questionnaire
Cooper (1976)	Frequency of information seeking	VEBC (Vocational Exploration Behavior Checklist): frequency of 12 types of exploration behavior, return of subjects to counseling center to obtain occupational information
Harris (1974)[a]	Amount of exploratory behavior	Use of school vocational library, conferences with counselors
Jones & Krumboltz (1970)	Variety of information seeking ("vocational exploratory activities")	VEBI (Vocational Exploratory Behavior Inventory): people talked to, materials read, etc.
Krivatsy & Magoon (1976)	Frequency of information seeking Variety of information seeking	Vocational checklist
Krumboltz & Schroeder (1965)	Frequency of information seeking Variety of information seeking	Interview
Krumboltz & Thoresen (1964)	Frequency of information seeking Variety of information seeking	Interview
Samaan & Parker (1973)	Frequency of information seeking	Questionnaire

[a]Results of reports from several investigations of computer-aided guidance systems.

Table 3

Instrumental Behavior as Dependent Variable - Continued

Study	Criterion behavior	How measured
Thoresen & Hamilton (1972)	Frequency of career exploratory behavior Variety of career exploratory behavior	Interview
Thoresen & Krumboltz (1968)	Frequency of information seeking Variety of information seeking	Interview
Thoresen et al. (1967)	Frequency of information seeking Variety of information seeking Obtaining job	Interview
Thoresen et al. (1970)	Frequency of information seeking	Interview
Zener & Schnuelle (1976)	Frequency of information seeking Variety of information seeking	Questionnaire

the subjects' reports by checking library records, TV and radio program guides, etc. Most investigators using structured interviews have attempted to verify the self-reports of random samples of subjects, and they have concluded that such interviews are highly valid (Krumboltz & Thoresen, 1964; Samaan & Parker, 1973; Thoresen & Hamilton, 1972; Thoresen & Krumboltz, 1967; Thoresen & Krumboltz, 1968; Thoresen, Hosford, & Krumboltz, 1970).

Zener and Schnuelle (1976) modified the Krumboltz and Schroeder (1965) checklist to expand the range of information-seeking behaviors and administered the resulting instrument as part of a followup questionnaire. Cooper (1976) used the same instrument, and Krivatsy and Magoon (1976) used an adaptation of the Zener and Schnuelle questionnaire. Jones and Krumboltz (1970) also used a questionnaire similar to the Krumboltz and Schroeder (1965) interview schedule.

Only one of the studies in Table 3 (Thoresen, Krumboltz, & Varenhorst, 1967) assessed an instrumental behavior other than career information seeking. In the course of individual interviews held 3 weeks after a single career counseling session, Thoresen et al. (1967) determined whether each subject had obtained (or made definite plans to obtain) a summer or part-time job connected with an occupation being considered.

Attitudes Toward Choice. Several attitudes toward career and educational preferences and goals are included in this category. As shown in Table 4, the most commonly assessed variable is certainty of career choice (sometimes called "decidedness" or "commitment"). Two studies (Hewer, 1959; Zener & Schnuelle, 1976) also measured satisfaction with the career choice. Barak, Carney, and Archibald (1975) used a rating technique that is typical of the certainty and satisfaction measures. Two items on their career assessment form had 5-point scales ranging from a score of "1" for "completely undecided" (about a career or major) to a score of "5" representing "completely decided." Also included in Table 4 is Cooper's (1976) career salience variable. Career salience, which is the importance of career (rather than the importance of a specific career) to the subject, was assessed by Angrist's (1972) Lifestyle Index.

Effective Role Functioning Measures

A second major category of career counseling outcome variables concerns what Myers (1971) has called "effective role functioning." These measures are further divided into "performance" variables and "adjustment" variables.

Performance Variables. Dependent variables of this type are concerned with academic performance or the assessment of some type of knowledge. Most counseling research using academic performance as a criterion has been educational counseling, and, thus, it is not covered in this paper. In his review, Myers (1971) has noted that grade point average (GPA) proved to be a disappointing outcome measure. Hill and Grieneeks (1966), in a comparison

Table 4

Attitudes Toward Career Choice as Dependent Variables

Study	Attitude	How measured
Anderson & Binnie (1971)	Commitment	3-point scale
Barak et al. (1975)	Decidedness	5-point scale
Cooper (1976)	Career salience	Lifestyle Index (Angrist, 1972)
Dressel & Matteson (1950)	Certainty	4-point scale (confused, a bit uncertain, fairly certain, certain and secure)
Healy (1973)	Certainty	"Pre-post counseling responses to questions regarding certainty of choice"
Hewer (1959)	Certainty	11-point scale
	Satisfaction	11-point scale
Hoyt (1955)	Certainty	11-point scale
Melhus et al. (1973)	Satisfaction	Occupational Plans Questionnaire: one item on 3-point scale (more, same, or less satisfied)
Ullrich (1973)	Certainty	11-point scale
	Satisfaction	11-point scale
Wachowiak (1973)	Certainty	11-point scale
	Satisfaction	
Zener & Schnuelle (1976)	Satisfaction	Questionnaire item on satisfaction with choice (5-point scale)
	Certainty	Questionnaire items on sureness of choice and doubts about choice (5-point scales)

of students seeking (and not seeking) educational and vocational counseling, found no differences between the two groups in GPA or rate of graduation.

Most dependent variables of the performance type have been measures of some kind of career-related knowledge. As shown in Table 5, the career knowledge being evaluated may involve career information in terms of vocational and educational opportunities and/or requirements, knowledge of tests and testing, or knowledge of career development theory. Most researchers used a quiz of some sort to measure career knowledge. In addition to using a quiz, Thoresen and Hamilton (1972) prepared simulation test booklets that contained short descriptions of situations involving career exploration. After reading each vignette, subjects were asked to specify how they would explore and evaluate the job involved. Both Krivatsy and Magoon (1976) and Zener and Schnuelle (1976) asked subjects to recall their Holland codes. Other measures of knowledge of Holland's theory, not clearly described, also were used in these two studies.

Adjustment Variables. There are two major subdivisions of adjustment variables: measures of career maturity and measures related to self-concept. Studies using the two types of variables are reported in Table 6.

Researchers who have used career maturity as a dependent variable have tended to excerpt items from instruments designed to measure this construct. Crites' Career Maturity Inventory (formerly the Vocational Development Inventory), Super's Career Development Inventory, and Cooley and Lownes' Readiness for Vocational Planning have been the instruments most frequently used. Some investigators have used the entire instrument (Myers, Lindeman, Thompson, & Patrick, 1975; Swails & Herr, 1976) or have attempted to check the adequacy of the adapted instrument (Mencke & Cochran, 1974; Perrone & Kyle, 1975). Smith and Evans (1973) used the Vocational Decision Checklist, which classified respondents into one of four stages of vocational development (exploration, crystallization, choice, or clarification).

The other major category of adjustment variables includes measures that relate to the client's self-concept. One such measure, the "incorporation score," has been developed by Healy (1968). The incorporation construct is based on the premise that career choice is an implementation of the self-concept (Super, 1957). Healy defines incorporation as the degree of similarity between a person's self-rating and his or her rating of an occupation on the same dimensions. Specifically, the subjects use 7-point semantic differential scales to rate both themselves and an occupation on (a) 25 occupationally relevant traits and (b) 22 bipolar personality traits. The "incorporation score" is obtained by summing the differences between the self-ratings and the occupational ratings for each of the two sets of traits, disregarding the direction of the differences and subtracting the total from 100 (score = $100 - \Sigma |x|$). Thus, higher incorporation scores represent

Table 5

Performance Measures as Dependent Variables

Study	Variable	How measured
Barahal et al. (1950)	Information on test scores, occupational information, additional campus counseling facilities	"Short achievement test"
Hill & Grieneeks (1966)	Grades; graduation	First semester grade point average (GPA), GPA for 3 years, graduation in 4 years
Krivatsy & Magoon (1976)	Knowledge of career development theory	Recall of Holland code, matching personality and occupational types
Perrone & Kyle (1975)	Career information	Knowledge of career instrument (50 items, multiple choice)
Thoresen & Hamilton (1972)	Knowledge of how to obtain and use relevant career information.	20 multiple-choice questions; test booklet containing vignettes involving career exploration, with subject required to explain procedure he or she would use.
Wright (1963)	Information on tests and test interpretation	Quiz on differentiation between tests, values and limitations of tests, normative data, and kinds of interpretive scores
Zener & Schnuelle (1976)	Knowledge of Holland's theory	Matching Holland's personality types to occupations
	Acquisition of knowledge about a chosen occupation	Banducci's (1968) measure of knowledge about occupations

Table 6

Adjustment Measures as Dependent Variables

Study	Variable	How measured
Babcock & Kaufman (1976)	Career maturity	Self-report questionnaire based on Career Development Inventory (CDI)
Krivatsy & Magoon (1976)	Career maturity	Items from Vocational Development Inventory (VDI)
Mencke & Cochran (1974)	Career maturity	Instrument containing items from VDI, plus items developed by authors to test experimental hypotheses
Myers et al. (1975)	Career maturity	CDI
Perrone & Kyle (1975)	Career maturity	Readiness for Career Planning (RCP) interview scale (short version of Readiness for Vocational Planning)
Smith & Evans (1973)	Vocational development stage	Vocational Decision Checklist: student categorized into exploration, crystallization, choice or clarification stage
Swails & Herr (1976)	Career maturity	VDI (Attitude Scale, portions of Competence Test)
Wachowiak (1973)	Decisionmaking stage	Vocational Decisionmaking Checklist
Zener & Schnuelle (1976)	Career maturity	Shortened versions of VDI and Interpersonal Competency Scale (Holland & Baird, 1968); rating of self-understanding (5-point scale)

Table 6

Adjustment Measures as Dependent Variables - Continued

Study	Variable	How measured
Healy (1968)	Incorporation scores	Differences between self-ratings and ratings on relevant characteristics
Healy et al. (1973)	Incorporation scores	Same as Healy (1968), but used range of incorporation scores
Hills & Williams (1965)	Self-concept	Adjustment index (same as Williams, 1962) Congruence score (same as Williams, 1962)
Williams (1962)	Self-concept	Adjustment index: measure of degree to which "good adjustment" items exceeded "poor adjustment" items in "like-me" sort (Butler & Haigh, 1954) Congruence score: measure of similarity between pairs of Self, Ideal Self, and Ordinary Person sorts (Butler & Haigh, 1954)
Williams & Hills (1962)	Self-concept	Adjustment index (same as Williams, 1962) Congruence score (same as Williams, 1962)
Tipton (1969)	Self-concepts of abilities	Client ratings of abilities using semantic differential technique

greater "incorporation" (greater similarity between self and occupation) because the summed differences are subtracted from 100, a procedure that results in higher scores for lesser differences. Using the same procedure, Healy, Bailey, and Anderson (1973) used range of incorporation scores as a dependent variable.

Several studies by Williams and his colleagues (Williams, 1962; Hills & Williams, 1965; Williams & Hills, 1962) have used two self-concept variables based on the Butler and Haigh (1954) Q-sort: the "self-adjustment score" and the "congruence score." Subjects were asked to sort the 74 Butler and Haigh items into two piles--"less like me" and "more like me." Three sorts were made. The first sort was according to the subject's current view of himself or herself, the second sort was in terms of the "ideal" person, and the last sort was a description of the "ordinary" person or student. The self-adjustment score was the sum of the number of "good adjustment" items placed in the "more like me" category and the number of "poor adjustment" items placed in the "less like me" direction. The congruence score was obtained by counting the number of items sorted identically for each pair of concepts (Self-Ideal, Self-Ordinary, Ideal-Ordinary) and taking the mean of the three scores.

In Tipton's (1969) research, subjects were asked to rate eight concepts relating to their academic ability or to their chances of achieving personal satisfaction in a given academic area. The semantic differential technique was used, and analyses were conducted to compare the pretest-posttest differences of the concepts for various groups of subjects. Another self-concept measure used to assess counseling outcome was an adaptation of Holland and Baird's (1968) Interpersonal Competency Scale. Zener and Schnuelle (1976) used a shortened version of this instrument, which asks the respondent for information or self-ratings concerning traits, life goals, home background, interests, competencies, and high school achievements.

Ratings of Counseling Satisfaction and Effectiveness

The counseling outcome measures described in this section assess counseling satisfaction and the perception of counseling effectiveness. As will be apparent from the descriptions of some of the measures, researchers have not always clearly differentiated between the two variables. Measures of perceived effectiveness, for example, have been interpreted as indicators of satisfaction. Also, a number of different terms have been used for satisfaction or effectiveness. The "enthusiasm" variable of Barahal, Brammer, and Shostrom (1950) can be considered a satisfaction measure, whereas usefulness or helpfulness of information, e.g., Babcock and Kaufman (1976) and Holmes (1964), pertains to effectiveness. Table 7, which summarizes outcome research using ratings of satisfaction or effectiveness, shows that almost all the studies have

Table 7

Ratings of Counseling Satisfaction and Perceived Effectiveness as Dependent Variables

Study	Variable(s)	How measured
Babcock & Kaufman (1976)	Helpfulness	Counseling Assessment Form: self-report questionnaire based on instrument developed by Graff & MacLean, 1970; client ratings of extent of help received in four educational-vocational areas in which client anticipated assistance
Barahal et al. (1950)	Client "feeling tone" (enthusiasm)	Responses to 20 items covered in structured interview rated by three raters on 5-point scale assessing degree of client enthusiasm
Cooper (1976)	Satisfaction with career exploration experience	Satisfaction Opinionnaire: self-report instrument containing nine items relating to satisfaction rated on 5-point scale (originally developed by Zener & Schnuelle, 1976)
Dressel & Matteson (1950)	Satisfaction	"Several questions" appended to Test Interpretation Rating Scale Instrument
Folds & Gazda (1966)	Usefulness of test interpretation and interview	Evaluation of Test Interpretation Questionnaire: self-report instrument containing these items concerning value of test interpretation and interview rated on 3-point scale ("very adequate" to "very inadequate")
Forgy & Black (1954)	Satisfaction	Questionnaire containing eight open-ended items rated by one author and two graduate students for satisfaction with counseling; checklist of statements describing attitudes toward counseling

Table 7

Ratings of Counseling Satisfaction and Perceived Effectiveness as Dependent Variables - Continued

Study	Variable(s)	How measured
Gilbert & Ewing (1971)	Helpfulness of information	Self-report questionnaire containing items on information about vocational planning, self, and university
Gladstein (1969)	Satisfaction	Client Satisfaction Scale: degree of satisfaction with counseling assessed by counting number of 13 items checked that related to specific aspects of counseling
Graff & MacLean (1970)	Helpfulness	Client ratings (3-point scale) of amount of help received in (10) educational-vocational areas in which client sought assistance
Healy (1973)	Satisfaction Effectiveness	Counselor judgments of client satisfaction and effectiveness (clarification of career direction); followup questionnaire on results of specific benefits, help in identifying career goals, motivation to obtain and use career information, help in selecting occupation, motivation to take occupational entry exams
Holmes (1964)	Helpfulness of test information	Counselor-Interview Rating Scale: self-report instrument containing 16 items assessing attitudes toward the value of receiving test information
Krivatsy & Magoon (1976)	Satisfaction Effectiveness	Vocational Guidance Questionnaire items: satisfaction with treatment, need for more information, need to see counselor, etc., client ratings on 5-point scale

Table 7

Ratings of Counseling Satisfaction and Perceived Effectiveness as Dependent Variables - Concluded

Study	Variable(s)	How measured
Linden et al. (1965)	Satisfaction Helpfulness	Client ratings (5-point scale) of four items from Counseling Evaluation Inventory: helpfulness of discussion of test results, clarification of goals, felt satisfied, believed other students could be helped
Smith & Evans (1973)	Helpfulness of aspects of counseling experience	Client ratings (5-point scale) of helpfulness of 10 "dimensions of vocational and educational counseling"
Thoresen & Krumboltz (1967)	Helpfulness of counseling interviews	Feeling of helpfulness ratings (5-point scale) by judges who rated recorded evaluation interviews
Westbrook (1974)	Effectiveness	Client ratings (4-point scale) of amount of learning occurring on preselected goals
Wright (1963)	Satisfaction with counseling	Client ratings (5-point scale) of satisfaction dimensions: warmth of relationship, coverage of test information, clarity of test interpretation, value of test interpretation
Zener & Schnuelle (1976)	Satisfaction Effectiveness	Questionnaire items rated by client on 5-point scale: would recommend self-directed search to friend, need for information, need to see counselor; authors summed responses for "would recommend SDS" and "need to see counselor" to obtain Evaluation Scale score

used client self-ratings. Only a few studies (Barahal et al., 1950; Forgy & Black, 1954; Healy, 1973) used judges' ratings.

Ratings of satisfaction and effectiveness may involve a global, overall measure of the variable of interest, or the ratings may assess specific facets of the variable. A global measure may consist of a single item, or it may represent an average or summation of two or more items. Barahal et al. (1950) used a global measure of satisfaction defined as an "overall feeling-tone rating." This rating was made by three judges who listened to recordings of structured interviews in which the interviewer covered 20 items that dealt with such aspects as clarity of future vocational plans and helpfulness of conferences with the counselor. Although the judges rated each item separately on a 5-point scale (from "very enthusiastic" to "dissatisfied and/or highly critical"), they also estimated an "overall feeling-tone rating" using the same 5-point scale. An example of a global measure resulting from the summation of items is Zener and Schnuelle's (1976) "Evaluation Scale." These researchers combined two highly correlated (r = .82) items ("I would recommend the SDS to a friend" and "My summary code seems reasonable") to obtain their global measure of satisfaction/effectiveness.

Ratings may also involve specific rather than global measures of satisfaction or effectiveness. Examples of specific outcomes used to assess satisfaction or effectiveness are "to recommend the vocational exploration experience to a friend" (Cooper, 1976), "setting up goals consistent with one's abilities and interests" (Graff, Danish, & Austin, 1972), and "clarification of career direction" (Healy, 1973).

Linden, Stone, and Shertzer (1965) have devised an instrument that, although not specifically designed for career counseling, could be used as an outcome measure of satisfaction with career counseling. The Counseling Evaluation Inventory developed by Linden et al. contains a subset of items that assesses client satisfaction. Some satisfaction items relate to process variables, but four items are concerned with outcome and are enumerated in Table 7. In addition, the authors have reported final scoring weights, factor loadings, test-retest reliability coefficients, social desirability ratings, and validity data for the instrument.

Also, it might be noted that although satisfaction and perceived effectiveness are considered outcome measures, some researchers base their assessment on process variables. Wright (1963), for example, obtained client ratings of the following: warmth of the relationship, coverage of the test information, clarity of the test interpretation, and value of the test interpretation for educational and vocational planning. Of these items, only the last is clearly an outcome measure. The assumption is that the warmer the counselor-client relationship, the more complete the coverage of the test information, etc., then the more effective the counseling.

Miscellaneous Measures

There are several miscellaneous variables that do not fit into the categories previously described. These dependent variables are summarized in Table 8.

One measure seldom used in career counseling research is the cost analysis conducted by Krivatsy and Magoon (1976). These authors calculated the mean cost per subject in terms of personnel time, personnel cost, materials cost, and a total cost (personnel cost plus materials cost). Barahal et al. (1950) also reported costs for (a) "the mean dollar estimate of the value of the guidance service" and (b) the actual costs for tests and personnel time.

Another infrequently used variable is Anderson and Binnie's (1971) measure of occupational aspiration, which these researchers adapted from Haller and Miller's (1963) Occupational Aspiration Scale. On this scale, the student is asked to select from jobs at 10 different occupational levels. Selections are made for realistic and idealistic preferences, as well as for short-range and long-range choices. The prestige of each of the subject's selections then is assessed following the Haller and Miller procedure.

A more commonly used outcome measure is number of career choice options. For this criterion, the subject is asked to state the career alternatives he or she is currently considering, and a count is made of the number of options. Before- and after-measures (Mencke & Cochran, 1974) of the number of options also may be used. There are some problems with using this kind of variable as an outcome measure, because a larger number of options may or may not be desirable for a particular client. A somewhat similar measure is to ask the subject to report the amount of time spent thinking about occupations or about self during a given period of time (Krivatsy and Magoon, 1976; Zener and Schnuelle, 1976). Again, the assumption is that "more is better"--that is, the more time an individual thinks about career-related concerns, the better that person's career decisions will be.

Table 8

Miscellaneous Measures as Dependent Variables

Study	Variable	How measured
Barahal et al. (1950)	Cost analysis	Mean dollar estimate of value of guidance service; actual costs for tests and personnel time
Krivatsy & Magoon (1976)	Cost analysis	Mean cost per subject calculated for personnel time, personnel cost, materials cost, and total cost
Anderson & Binnie (1971)	Occupational aspirations	Occupational Aspiration Scale: measured prestige of student career selections (Haller & Miller, 1963); change in expected educational level
	Change in career choice	Occupational/Educational Goals and Plans Questionnaire: measured pre-post change in expressed career plans
Babcock & Kaufman (1976)	Change in career choice	Pre-post change in expressed career choice
Melhus et al. (1973)	Change in career choice	Pre-post change in responses to item on Occupational Plans Questionnaire concerning client's career choice
	Change in total score on relevant questionnaire items	Amount (but not direction) of pre-post change in total score for Occupational Plans Questionnaire items concerning commitment to, appropriateness of, experience relevant to, and anticipated potential of occupational choice; and significance of occupational role in respondent's life.
Foreman & James (1973)	Change in test scale relevance	Pre-post measures of relevance of interest and personality test scales

Table 8

Miscellaneous Measures as Dependent Variables - Continued

Study	Variable	How measured
Cooper (1976)	Number of career options	Occupational Alternatives Question--subject asked to list all occupations he or she was currently considering
Krivatsy & Magoon (1976)	Number of career options	Number of occupations being considered
Mencke & Cochran (1974)	Number of career options	Pre-post measures of occupations the workshop participants were seriously considering
Zener & Schnuelle (1976)	Number of career options	Number of career alternatives being considered
Krivatsy & Magoon (1976)	Time spent thinking about jobs, self	Self-report of amount of time (a) spent thinking about jobs, per day; (b) spent thinking about self, last 4 weeks
Zener & Schnuelle (1976)	Time spent thinking about occupational choice	Questionnaire item (5-point scale)
Harris (1974)[a]	Time spent using computer-based system	Not specified; usually automatically recorded by computer

[a]Contains results from several investigations of computer-based guidance systems.

ISSUES IN CAREER COUNSELING OUTCOME MEASUREMENT

Several issues emerge from a survey of the outcome measures used in career counseling research. These issues are neither new nor unique to career counseling research. In fact, Williamson and Bordin (1941) touched on many of the same problems facing career counseling researchers today in their classic article, which critiques the methodology of vocational and educational counseling research over 35 years ago. Problems encountered in outcome research in psychotherapy often have their counterparts in outcome research in career counseling (Bergin & Garfield, 1971, Meltzoff & Kornreich, 1970).

These various problem areas are interrelated. Questions of validity, for example, are linked to the criterion used, whereas decisions concerning the instruments to be used depend on the operational definitions the researcher chooses for the constructs to be measured. The issues in this section relate to criteria, instruments, and design and analysis. Most problems that the career counseling outcome researcher must resolve can be subsumed under these general categories.

Criteria of Career Counseling Outcome

The criterion issue has perpetually bedeviled counseling research, and there are several aspects of the criterion problem to consider. One aspect concerns selection of immediate or ultimate criteria. Another facet of the criterion issue relates to the use of change as a criterion. In addition, there are infrequently used criterion measures that deserve special attention.

Immediate vs. Ultimate Criteria. One aspect of the criterion debate has involved the relative merits of immediate and ultimate criteria. Gonyea (1962) pointed out that the attrition problem complicates the collection of long-range criteria data. Because the attrition of subjects is probably selective, sampling problems become even more complex. In addition, the longer the time since concluding the counseling, the greater the probability that factors other than the counseling experience have affected the outcome. The effect of other factors may account for research evidence that short-term and long-term measures of the same variable do not correlate very highly. Hewer (1966), for example, used the current occupation of her subjects as the criterion of appropriateness in a followup of an earlier study (Hewer, 1959). She compared the earlier judges' ratings of appropriateness with the occupations the subjects pursued some 8 years later and concluded there was "no relationship between the judges' ratings of realism of vocational choice and realism as determined by similarity of the original choice and current employment" (Hewer, 1966, p. 292). The question posed by Hewer's research is whether the lack of correlation between the two measures of appropriateness was caused by the lack of validity of judges' ratings or by the various influences on the subjects during the years between the original and followup studies.

Another facet of immediate versus ultimate criteria has been suggested by Katz (1975), who pointed out that we do not require long-term payoffs for competencies such as typing, reading comprehension, woodworking, or social studies. Accordingly, Katz questioned the need for assessment of long range, real-life outcomes for career decisionmaking. If it is agreed that career decisionmaking is a desirable skill, Katz' argument would hold that the researcher determines whether the skill has been acquired, not whether the skill predicted a long-range criterion such as job success. Myers (1971) came to a similar conclusion from his conceptualization of career development as a series of choice points, with each choice influencing the one that comes after it. Myers argued that it is unlikely that short-term career counseling can have much measurable long-term effect, considering the far greater effect each choice actually made will have on subsequent choices.

Change as a Criterion. Another aspect of the criterion problem relates to using change as an outcome measure. Some investigators have used changes in career choice as outcome measures (Anderson & Binnie, 1971) or changes in the number of career options being considered (Cooper, 1976; Krivatsy and Magoon, 1976; Mencke & Cochran, 1974; Zener and Schnuelle, 1976). It is possible, though, that change per se is not necessarily a desirable outcome. If, in changing, the client ends up with a less realistic career choice than he or she had before, change is undesirable. In like manner, an increase in the number of career options might be a positive outcome for clients who are in the exploratory stage of career decisionmaking whereas a decrease in career options would be advantageous for clients in a later stage. A similar argument would hold for other variables, such as certainty of career choice. Higher certainty for an unrealistic career choice might be less desirable than lower certainty for a realistic choice. Change, even if its direction is predicted, would thus appear to have shortcomings as a dependent variable. The implication of such considerations, then, is that change criteria should differ from client to client. Some authorities, e.g., Bergin (1971) and Krumboltz (1966), have already recommended that the goals of counseling or therapy should be unique to each client.

Neglected Criteria. There are other infrequently used criteria that seem to have advantages as outcome measures of career counseling. Such criteria include instrumental behaviors and cost analysis.

To date, almost all the instrumental behaviors used as dependent variables for career counseling have been measures of some kind of information seeking. There is no reason, however, why other instrumental behaviors could not be used. For example, did the client obtain a job (Thoresen et al., 1967) or enter a training program? In the Army context, did the officer actually complete a career plan? Did the enlisted woman register for and complete a civilian education course that would enhance her chances for promotion?

Another infrequently used measure is cost-benefit analysis. With this outcome measure, an assessment is made of the effectiveness of the career counseling treatment and of its cost. Given two equally effective modes of test interpretation, for example, the one that is available at lower cost probably will be chosen. On the other hand, a less expensive approach may not be selected as the treatment of choice if another, more costly, method is of sufficiently greater effectiveness. Historically, cost-benefit techniques have been used primarily by economists in evaluating social change and the relative desirability of different social policies (Rothenberg, 1975). With deflated financial resources of government agencies and other institutions, however, the goal of such analyses in evaluation research is "to determine that strategy or combination of strategies that maximizes the desired result for any particular resource or budget constraint" (Levin, 1975, p. 89). Since accountability is of increasing importance to organizations and institutions, cost-benefit analyses are likely to become more frequent in career counseling outcome research.

The advantages of some of these less frequently used outcome variables in terms of nonreactive measurement will be discussed later. The point here is that certain criteria not extensively used heretofore--e.g., cost-benefit analysis or archival data on career information seeking--might be considered more frequently by career counseling researchers as supplementary measures to more traditional criteria.

Instruments

After the criteria of career counseling outcome have been chosen, instruments must be selected or constructed. Several problems may need to be resolved in making decisions about instruments; these concerns involve operational definitions, the type of instrument, and the reliability and validity question.

Operational Definitions. Zytowski and Betz (1972) have argued strongly for greater care in measurement in counseling research. These authors have pointed out the need for clear, precise definitions of the constructs to be measured. One of the fuzzy areas of career counseling outcome research concerns the definition of career "choice" or "preference." Many reports of outcome research do not make clear what the subject was asked to do in specifying his or her career choice. Crites (1969) has presented a comprehensive discussion of this particular definitional problem (pp. 127-135). In his discussion, Crites reviewed the ways in which career choice has been defined, made a critical analysis of these definitions, developed an operational definition of choice, and enumerated the necessary conditions for the expression of a career choice. Crites' (1969) text also contains a section on measures of vocational choice in which the author has described previously used instruments (pp. 135-148). Crites' treatment of the problem of defining and measuring career choice is an example of the type of approach that Zytowski and Betz (1972) have called for with respect to career counseling constructs.

Type of Instrument. After the constructs to be measured have been defined, the researcher must decide which type of instrument is most suitable for the objective. As shown in Tables 1-8, most measures in career counseling outcome research have involved self-report. Zytowski and Betz (1972) reported that two-thirds of the instruments they reviewed were self-report measures. Most of the remainder required the quantification of judgments about other people or the counseling process.

Self-reports have been obtained by questionnaires, interviews, Q-sort techniques, or tests. Judges' ratings have also been extensively used, especially for measures of realism and self-knowledge. Even when judges' ratings comprised the criterion, self-report measures (such as test results or expressed career choice) were usually used in making the judgments.

For the same criterion, several different types of instruments could be used. If the dependent variable involves career information seeking, for example, data can be obtained through a questionnaire, e.g., Zener and Schnuelle (1976); an interview, e.g., Krumboltz and Thoresen (1964); or counseling center records, e.g., Cooper (1976). The ease, precision, and reactivity of the various types of data collection must be weighed in selecting the best instrument for any given situation. Although a questionnaire may be easily administered and objectively scored, it may lack the flexibility of an interview in following up on aspects of the research not anticipated beforehand. Counseling center records may provide the means for an unobtrusive measure of career information seeking, but similar records may be unavailable in other settings.

To a large extent, dependent variables used in career counseling research have tended to be "reactive" measures (Webb et al., 1966). Thus, the measurement process itself may influence the outcome of a career counseling experiment. Such an effect would be especially likely in pretest-posttest designs, commonly used in career counseling outcome research. Although real change may occur, it may be because of the measurement activity rather than the treatment. Randomization and the inclusion of control groups, two common techniques used to assure "internal" validity (Campbell & Stanley, 1966), may be ineffective when reactive measures are used.

Considering the unknown and possibly sizable effects of reactive measurement, it is surprising that so few career counseling researchers have not attempted to assess or control for such effects. One way of determining the effect of a pretest, for example, would be to employ a Solomon four-group design (Campbell & Stanley, 1966, pp. 24-25). A posttest-only control group design will also eliminate pretest effects by eliminating the pretest. With respect to this latter design, Campbell and Stanley (1966) commented that although the pretest is "a concept deeply embedded in the thinking of research workers in education and psychology, it is not actually essential to true experimental designs" (p. 25). These authors have also noted that although the Solomon four-group design is preferable, its advantages may not outweigh the doubled effort involved unless randomization is not possible.

An inspection of Tables 1-8 reveals that only two studies used nonreactive outcome measures. Krivatsy and Magoon (1976) analyzed the costs of materials and personnel time to evaluate the relative expense of three different career counseling treatments, and Cooper (1976) recorded whether or not subjects returned to the counseling center for career information. Dependent variables of the types just described are examples of measures both objective and nonreactive. It is my opinion that a larger proportion of career counseling outcome measures should be objective and nonreactive, especially in cases where randomization cannot be achieved or the comparison group is not a true control group.

For a comprehensive discussion of the hazards of reactive measurement and a compendium of unobtrusive measures, see Webb et al. (1966). Weinstein's (1975) chapter on using information systems to evaluate mental hygiene programs also contains information pertinent to assessing career counseling outcomes. Researchers charged with the evaluation of counseling center operations may find Weinstein's paper of particular interest.

Reliability and Validity. Another problem the career counseling researcher must consider in devising or selecting instruments relates to their reliability and validity. Zytowski and Betz (1972), in their review of measurement in counseling research, documented the inadequacy of the reliability and validity data that have been reported in the literature. The career counseling outcome research that has been surveyed in this paper has tended to be remiss in presenting reliability and validity data. Exceptions to this generalization are criteria involving judges' ratings and career information seeking. About half the studies using judges' ratings presented data on interrater reliability. Rogers (1954) reported test-retest reliability of the instrument he devised for self-estimates of interests and aptitudes, and Linden et al. (1965) provided both reliability and validity data on their Counseling Evaluation Inventory.

Zytowski and Betz (1972) concluded that counseling research (either process or outcome) should not be published without "some minimal indications of the reliability and validity of the instrument on which the research is based" (p. 78). Specifically, they recommended that researchers report the results of any previous reliability studies, estimates of internal consistency, and test-retest reliability (where indicated). With respect to the more difficult problem of validity, Zytowski and Betz suggested that construct validity is perhaps the most feasible type. The researcher should first write a descriptive statement that clearly and precisely defines the construct and then generate validity data through research on group differences, correlation with other variables, treatment effects, and the like. For example, realism of alternate specialty preference could be defined in terms of a choice that is consonant with an officer's educational level, undergraduate (or graduate) major, previous assignments, and primary specialty. Research then could be designed to determine whether degree of realism of alternate specialty preference differentiated officers who leave the Army early in their careers from those who leave it later (group differences). Other studies could

investigate such questions as the relationship between realism of the preferences and later satisfaction in those alternate specialties (correlation with other variables) or the effects of a computer-aided career planning intervention on the realism of expressed preferences (treatment effects).

Design and Analysis

Researchers face other difficulties relating to experimental design. Some of the problems may be particularly troublesome to the person engaged in career counseling outcome research, because such research frequently involves real clients, real counselors, and real counseling environments. In all field research, the researcher exercises less control over the research design than is usually the case in a laboratory setting. Lesser control may jeopardize both the internal and external validity of the study. Design concerns considered here include local control, assignment of subjects, and comparison groups. Design type is considered in relation to these concerns, and some associated analysis problems are noted.

Local Control. Volsky et al. (1965) have used the term "local control" for procedures that either eliminate factors contaminating the dependent variable or incorporate the factors into the research design. Volsky et al. called these techniques "controlling out" and "controlling in." An example of the first type would be restricting one's sample to self-referred clients, thus "controlling out" the contaminating influence of persons who have been required to come for counseling. The second type would be illustrated by incorporating into the design different client characteristics such as gender or level of career maturity. When such controls are built into the research design, it is possible to detect main effects and interactions due to these variables.

Assignment of Subjects. Randomization is the sine qua non of experimental research. Assigning subjects randomly does not mean that the groups are equated on pertinent variables. However, it does assure that the risk of significant imbalance is the same as the level of risk assumed by the statistical techniques employed.

Desirable as randomization is, however, it cannot always be attained. Particularly in fieldwork, randomization may be impractical if not impossible. A researcher may have to work with intact groups such as orientation classes, for example, selected by the student subjects for nonrandom reasons such as time of day. Even when clients are randomly assigned to career counseling groups, the randomization process may be preempted by the restrictions imposed by the subjects' course schedules.

When randomization is imperfect, the risk of an interaction between subject selection and treatment is increased. Kelley et al. (1970) assessed 73 reports of counseling research for sources of invalidity and found that a selection-treatment interaction was a "definite weakness" in 61.6% of the studies and a "probable weakness" in the remaining 38.4%. Although the investigations reviewed by Kelley et al. were not limited

to career counseling and included process as well as outcome research, his results illustrate the prevalence of inadequate randomization.

For a more detailed discussion of randomization and its associated problems for counseling research, the reader is referred to Volsky et al. (1965, chapter IV).

Comparison Groups. One major problem in all counseling and therapy research lies in the difficulty of obtaining appropriate comparison groups. Usually, the comparison is made between an "experimental" group that received the treatment or intervention and a "control" group that did not. To deny treatment to individuals who want it in order to obtain a control group may not be ethically defensible. The solution to this ethical dilemma in career counseling research has often been to use a "wait-control" group. After the subjects are randomly assigned to two groups, one group of subjects is given the counseling intervention immediately, and treatment for the control group is postponed until after posttest measures are made on both groups.

Unfortunately, denying or postponing treatment does not necessarily preclude the control subjects' receiving help from other sources. People who are motivated to seek career counseling in the first place may also be motivated to seek help from other sources, rather than wait until the termination of counseling for the experimental group. In Campbell and Stanley's (1966) terms, "history" as a source of invalidity may contaminate the control group or individuals in the control group. Some event other than the experimental treatment occurs that may have some of the same effects as the treatment.

In a discussion of the effects of withholding counseling services, Volsky et al. (1965) reported a study in which all control subjects in the experiment refused treatment when it was finally available to them. This situation apparently occurred because the experimental treatment ended near the end of the spring term, with final examinations impending. Given that there are such effects, Volsky et al. (1965) asked, "What can be used as the placebo comparable in all dimensions except the relevant treatment variable in subsequent experimentation?" (p. 161). The authors concluded that the best that can be done in terms of classical experimental methods is to compare treatment methods, using random assignment of subjects to the various groups.

Control groups may be less necessary in career counseling outcome research than in other types of psychological research. Almost all career counseling outcome studies using a control group found their experimental groups scored higher on the outcome measures than did the control groups, e.g., Hoyt (1955), Tipton (1969), and Wright (1963). In fact, this superiority of career counseling over none is about the only consistent finding of outcome research. Thus, the suggestion of Volsky and his colleagues to compare different methods of counseling instead of comparing experimental and control groups may represent a practical course for the career counseling researcher.

Type of Design. Campbell and Stanley (1966) and Cook and Campbell (1976) have presented in detail the various types of pre-experimental, experimental, and quasi-experimental designs available to researchers in the behavioral and social sciences. Because pretest-posttest designs have been used so frequently in career counseling outcome research, the focus of this discussion will be on the pretest-posttest design and some alternatives to it. The researcher's choice of design and type of data analysis will depend to a great extent on whether subjects can be randomly assigned to treatments and on the type of comparison group(s) available.

A research design proposed by Crites (1964) includes control groups and allows the researcher to assess the effects (in many instances) of pretesting and time, both of which are possible sources of confounding. In his description of this design, Crites has noted possible statistical tests which can be made and has suggested the possible significance of results in terms of counseling effects.

Though often used, pretest-posttest designs involve other hazards for outcome research (unless controlled for as in the Crites design). Administering a pretest may sensitize subjects to the treatment they are to receive and may also produce a practice effect. Accordingly, Campbell and Stanley (1966) have pointed out the assets of the posttest-only design. Those authors suggested that the advantages of the Solomon four-group design over the posttest-only control group design may not compensate for the doubled effort. The Solomon four-group design permits the investigator to assess the effects of the pretest. Nunnally (1975) has also recommended the posttest-only design, characterizing it as "the workhorse of evaluation research" (p. 123). If certain conditions apply, however, a pretest-posttest design should be considered.

These conditions are that the (a) number of subjects in each cell is small, (b) subjects show a wide variation (large standard deviation) on the dependent variable compared to the expected effects of the independent variable (treatment), and (c) pretest-posttest correlation of the dependent variable is expected to be high. When these three conditions apply and it is reasonable to expect pretest-treatment interactions and pretest-posttest interactions to be slight, Nunnally has suggested using a pretest-posttest design.

Although the career counseling outcome researcher often may be able to assign subjects randomly to different treatments and to a wait-control group, sometimes such procedures are not possible. Intact groups, e.g., orientation classes, may have to receive the different treatments and to serve as the control group(s). When intact groups must be used, Nunnally (1975) suggested using a control group and obtaining measures on the dependent variable before and after the counseling treatment. With this type of quasi-experimental design, then, pretest-posttest measures are needed.

Data Analysis. Whether an experimental or quasi-experimental design is used determines the type of analysis to be used. Nunnally (1975) stated that the statistical analysis of data in true experiments is generally not controversial; but such is not the case for methods of analyzing data from quasi-experimental designs. For example, Nunnally challenged the practice of using covariance analysis when an intact group is used as a control group. Instead, the author suggested using a repeated-measures analysis of variance with the pretest-posttest measures as a within-subjects factor. In this analysis, the focus of interest would be the interaction of the treatment condition with the comparison groups. Nunnally has presented examples of both simple and complex designs of this type. He also suggested using a conservative approach for any post hoc tests and recommended obtaining measures of strength of association to help the researcher decide whether differences between treatments are meaningful for real world situations. The reader is referred to Nunnally (1975, pp. 134-136) for recommendations and rationales.

IMPLICATIONS FOR FUTURE RESEARCH

This paper has surveyed the instruments used in career counseling outcome research, and some of the issues raised by the outcome research have been considered. What, then, are the implications of the findings for the career counseling researcher? The intent of the following discussion is to focus on some specific recommendations that emerge from the shortcomings of career counseling outcome research. Most suggestions were made previously by authors critiquing research on psychotherapy, counseling, and guidance. For clarity, the specific points to consider will be grouped as they relate to criteria, instruments, or design and analysis.

Recommendations for Criteria

Use Multiple Criteria. Don't use only one dependent variable; use several. Career counseling outcomes are multidimensional; one measure is not adequate. Also avoid using all the same types of measure. For example, include behavioral and archival data, as well as attitudinal variables.

Use Specific Rather Than Global Measures. The use of a global criterion may not tap the underlying dimensions. Bergin and Garfield (1971) stressed the superiority of specific over global measures and also suggested that perhaps individual criteria should be developed for each client. Krumboltz (1966) also argued for unique goals for each client. Career counseling outcome research has not incorporated such criteria into research designs as yet. An example given earlier concerned change as a criterion. An increase in career options might be desirable for one client and a decrease desirable for another, depending on the client's career decisionmaking stage.

Emphasize Short-Term Measures. It may be unrealistic to expect long-term effects from the minimal interventions used in most career counseling research (Myers, 1971). A well-designed, large-scale, longitudinal study obviously will require repeated measures over a long period of time. Because most career counseling outcome research is not of this type, short-term measures are usually called for.

Define Constructs Carefully. Mitchell et al. (1974) expressed the opinion that most studies on career decisionmaking are of limited use because constructs and instruments are not comparable across the various studies. Zytowski and Betz (1972) also stressed the need for more careful definitions of constructs. An example was given previously from Crites (1969) that illustrated the type of approach needed.

Recommendations Relating to Instruments

Use Instruments From Previous Research. Obviously, one cannot follow this suggestion if no instrument exists that measures the construct of interest. All too often, however, researchers "reinvent the wheel." Constructing a good instrument is not an easy task. A larger pool of sensitive and reliable instruments would be available if each researcher built on the work of predecessors in the area of instrumentation.

Report Reliability and Validity Data for the Instruments You Use. Of the studies surveyed in this paper, about one-third presented data on reliability and one-sixth on validity. A major point made by Zytowski and Betz (1972) was that information on reliability and validity should be reported routinely on all instruments used in counseling research. These authors also found that such data typically are not included in reports of counseling research. If a researcher uses an already-developed instrument for which reliability and validity have been established, considerable time and effort can be saved. An investigator should be aware, however, that in order to obtain comparable results, it is necessary to use the instrument in the same fashion that the original researcher used it. A number of career counseling outcome studies have used only portions of standardized instruments. Unless the reliability and validity of the adapted instrument can be established, there is no assurance that it measures the same construct or is as reliable as the original instrument.

Use Objective Rather Than Subjective Measures. In general, ratings by subjects or judges are not considered as valid measures as are more objective types of assessment devices. Not one of the "good" studies Meltzoff and Kornreich (1970) surveyed used judges' or patients' ratings of therapy outcome. Even if the same instrument (rating form) is used, results may not be reliable if different raters are used across studies. Judges' ratings have been used extensively for certain variables, such as appropriateness of career choice. A more objective method of assessing appropriateness is comparing the Holland code from a test (such as

the VPI, the SDS, or the Strong-Campbell Interest Inventory) with the Holland code of the subject's expressed career choice, e.g., Mencke and Cochran (1974), Zener and Schnuelle (1976).

Make Use of Nonreactive Measures Whenever Possible. Because nonreactive measurement has so many merits (Webb et al., 1966), it is somewhat surprising that so few career counseling outcome studies have used unobtrusive measures. However, such measures are much more difficult to devise and may require considerably more ingenuity on the part of the researcher. Archival data such as that used by Cooper (1976) and the cost benefit analysis technique employed by Krivatsy and Magoon (1976) are nonreactive outcome criteria already in the career counseling research literature.

Recommendations Concerning Design and Analysis

Assign Subjects Randomly to Treatment and Control Groups. If randomization is used, the investigator can assume that no systematic bias was introduced into the composition of the various groups. Thus, if random assignment is possible, the researcher can place greater confidence in the internal validity of his or her study. If intact groups must be used, employ a pretest-posttest design and analyze the data by a repeated measures analysis of variance (Nunnally, 1975).

Include a Control Group in the Research Design. A control group is needed to establish the internal validity of a study. The ethical question on denial of treatment can be resolved by using a wait-control group. This group will receive career counseling after treatment has been concluded for the experimental subjects. If no control group is possible, compare different treatments.

Estimate Sample Size Needed. As Bailey (1971) has pointed out, the use of more subjects than are needed to detect meaningful differences is "a waste of resources" (p. 323). Career counseling researchers have limited time as well as money for tests and other materials. Many researchers, thus, omit the step of calculating the size of the sample they need. One reason for neglect of this procedure is the difficulty in estimating how large a difference would have to exist in order for it to matter. Such judgments require the researcher's subjective evaluation of the role of factors such as the kind of outcome measure, the characteristics of the sample, and the level of effort required by the treatment. More detailed discussion of the problem of estimating sample size and the methods to use can be found in sources such as Bailey (1971) and Winer (1971).

SUMMARY

This paper reviewed measures previously used in career counseling outcome research. The purpose of the review was to provide background for the construction of instruments to be used in evaluating a computer-based career information and planning system for Army officers.

Some of the general considerations relating to career counseling outcome research were the types of behaviors to be measured, where and when the assessment would take place, the availability of valid and reliable instrumentation, and the objectives of the research effort. Previously used career counseling outcome measures were surveyed using a taxonomy from Myers (1971), which was expanded slighted to incorporate additional types of measures. Each kind of measure was described, a typical example of it was presented, and any variants of that type were noted. For the reader's convenience, the various studies were summarized in eight tables which corresponded to the eight major categories of outcome measures.

From this survey of career counseling outcome measures, a number of interrelated issues emerged. These issues were discussed in terms of their relationship to criteria, instruments, or design and analysis. The implications of these issues for future research were incorporated into a series of recommendations for the career counseling outcome research.

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