Technical Report 487

THE EFFECT OF DECISION TRAINING ON CAREER DECISION-MAKING COMPETENCE

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This research investigated the effectiveness of a multicomponent training program in career decision-making (CDM) on attitudes about, knowledge of, and ability to perform a specified set of CDM behaviors.

Participants from third-year high school English classes were stratified by sex and randomly divided into experimental and control groups. Experimental students participated in a career decision skills training program consisting

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of seven weekly meetings of about 1 hour each, plus a variety of homework assignments. The control students did not receive any CDM training.

Three criterion measures were used to assess the effectiveness of the CDM skills treatment. The Check List of Decision-Making Ability, administered before and after training, measures self-rated efficacy estimates of ability of perform certain decision behaviors and provides data from the affective domain. The Career Decision-Making Skills Assessment Exercise measures knowledge of facts and procedures relevant to CDM and is a cognitive instrument. Performance domain data were generated by a Career Decision Simulation, an individually administered instrument that assesses how well a person performs a simulated decision task.

Results provide evidence that a structured training program in career decisionmaking based on social learning principles is effective in producing superior scores on measures of career decision-making competence.

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THE EFFECT OF DECISION TRAINING ON CAREER DECISION-MAKING COMPETENCE

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Basic Research in
Career Decision-Making

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FOREWORD

As a part of its Technological Base research program, the Army Research Institute for the Behavioral and Social Sciences (ARI) supports efforts to expand the knowledge base of exploratory development in personnel use of differential career planning development for both officer and enlisted personnel. The research described here develops and evaluates a methodology for decision training for more effective choice of career options.

This research, which underpins continuing research in the Personnel Utilization Technical Area, was funded under Army Project 2Q161102B74F.

JOSEPH ZEIDNER
Technical Director

THE EFFECT OF DECISION TRAINING ON CAREER DECISION-MAKING COMPETENCE

BRIEF

Requirement:

Issues regarding identification and definition of relevant career development domains, most appropriate content and modes of instruction, and procedures and instruments used to assess career education curriculums are largely unresolved. This research was undertaken to answer some of the fundamental questions being asked by consumers of career development programs.

Procedure:

Students from third-year high school English classes were stratified by sex and then randomly divided into experimental and control groups. Experimental students participated in a career decision-making skills (CDM) training program consisting of seven weekly meetings of about 1 hour each and completed a variety of homework assignments. The control group did not receive any CDM training. Criterion measures used to assess the CDM skills treatment were the following: (a) Check List of Decision-Making Ability, administered before and after training, which measures self-rated efficacy estimates of ability to perform certain decision behaviors; (b) Career Decision-Making Skills Assessment Exercise, which measures knowledge of facts and procedures relevant to CDM; and (c) Career Decision Simulation, an individually administered instrument that assesses how well the individual performs a simulated decision task.

Findings:

Results provide evidence that a structured training program in career decisionmaking based on social learning principles is effective in producing superior scores on measures of career decision-making competence.

Utilization of Findings:

This investigation focused on a group that represents a prime recruiting population for the Army--secondary school students who are about to seek their first full-time employment or are looking for educational and training opportunities. Findings suggest how students use occupational information to arrive at career choices. Results suggest formats as sequences of occupational information that should be considered in any kind of recruitment effort seeking to present career opportunities.

THE EFFECT OF DECISION TRAINING ON CAREER DECISION-MAKING COMPETENCE

CONTENTS

	Page
INTRODUCTION AND REVIEW OF THE LITERATURE	1
Career Decision-Making Models	1
Career Decision-Making Research	7
Decision-Making Training Programs	10
Evaluation of Decision Training	10
The Problem	11
Indexes of Career Decision-Making Competence	14
Summary	14
METHOD	15
Introduction	15
Specific Objectives	15
Experimental Design	16
Experimental Treatment	22
Instruments	28
RESULTS AND DISCUSSION	38
Research Hypotheses	38
Interactions and Main Effects	39
Intercorrelations Between Dependent Variables	73
SUMMARY, CONCLUSIONS, AND IMPLICATIONS	80
Purpose	80
Specific Objectives	82
Research Hypotheses	82
Method	83
Specific Findings	84
Conclusions and Implications for the U.S. Army	85
Limitations and Suggestions for Future Research	88
REFERENCES	91
APPENDIX A. STATEMENT OF CONSENT	97
B. PROPOSITIONS IIA1, IIA2, AND IIA3 FROM KRUMBOLTZ's SOCIAL LEARNING THEORY OF CAREER DECISIONMAKING	99
C. STUDENT'S WORKBOOK: A SEVEN-LESSON CAREER DECISION TRAINING PROGRAM	103

Page

APPENDIX D. MASTER LESSON PLANS FOR UNITS 1-7 OF A CAREER DECISION TRAINING PROGRAM 149

E. CHECK LIST OF DECISION-MAKING ABILITY (CLDMA) 163

F. DIRECTIONS FOR THE CAREER DECISION SIMULATION (CDS) . . . 165

G. THE CAREER DECISION SIMULATION ADMINISTRATOR'S MANUAL . . 169

H. CHECK LIST OF DECISION-MAKING ABILITY (CLDMA) PRE- AND POSTTREATMENT FACTOR LEVEL MEANS FOR ITEMS 1-8 . . . 195

I. ANALYSIS OF VARIANCE OF CAREER DECISION-MAKING SKILLS ASSESSMENT EXERCISE TOTAL AND SUBSCORES AS A FUNCTION OF TREATMENT, SEX, AND CLASS/INSTRUCTOR 211

LIST OF TABLES

Table 1. Summary of the number of interested and noninterested students in the five participating classes 18

2. Total number of students contributed by each participating English class 21

3. Number of participants by sex and class of origin for experimental and control groups 22

4. Information about CDM skills training program instructors . 23

5. Means and standard deviations for Check List of Decision-Making Ability (CLDMA) scores 41

6. Analysis of variance of total gain score on the Check List of Decision-Making Ability as a function of treatment, sex, and class/instructor 43

7. Means and standard deviations for CLDMA total gain score . . 45

8. Analysis of covariance of posttreatment total score on the Check List of Decision-Making Ability as a function of treatment, sex, and class/instructor with pretreatment total score as a covariate 47

Page

Table 9. Means and standard deviations for CLDMA posttreatment total score 49

10. Treatment group means and standard deviations for Career Decision-Making Skills Assessment Exercise scores 50

11. Treatment group totals, means, and percentages on selected CDMSAE total score variables 52

12. Pearson product-moment correlations of potential covariates with dependent variables 53

13. Analysis of covariance of total score on the CDMSAE as a function of treatment, sex, and class/instructor with GPA, math, and reading scores as covariates 55

14. Analysis of covariance of "define" subscore on the CDMSAE as a function of treatment, sex, and class/instructor with GPA, math, and reading scores as covariates 56

15. Analysis of covariance of "establish" subscore on the CDMSAE as a function of treatment, sex, and class/instructor with GPA, math, and reading scores as covariates 57

16. Analysis of covariance of "clarify" subscore on the CDMSAE as a function of treatment, sex, and class/instructor with GPA, math, and reading scores as covariates 58

17. Analysis of covariance of "identify" subscore on the CDMSAE as a function of treatment, sex, and class/instructor with GPA, math, and reading scores as covariates 59

18. Analysis of covariance of "discover" subscore on the CDMSAE as a function of treatment, sex, and class/instructor with GPA, math, and reading scores as covariates 60

19. Analysis of covariance of "eliminate" subscore on the CDMSAE as a function of treatment, sex, and class/instructor with GPA, math, and reading scores as covariates 61

20. Analysis of covariance of "start" subscore on the CDMSAE as a function of treatment, sex, and class/instructor with GPA, math, and reading scores as covariates 62

21. Treatment group means and standard deviations for Career Decision Simulation scores 64

Page

Table 22. Analysis of covariance of "accuracy" score on the CDS as a function of treatment, sex, and class/instructor with GPA, math, and reading scores as covariates 66

23. Means and standard deviations for CDS "accuracy" score . . 68

24. Means and standard deviations for STBA reading score . . . 68

25. Means and standard deviations (all factors) for CDS "accuracy" score 70

26. Analysis of variance of CDS values congruence score (time 1) as a function of treatment, sex, and class/instructor 71

27. Analysis of variance of CDS values congruence score (time 2) as a function of treatment, sex, and class/instructor 72

28. Analysis of variance of CDS thoroughness of search score as a function of treatment, sex, and class/instructor . . . 74

29. Analysis of variance of CDS confidence score as a function of treatment, sex, and class/instructor 75

30. Pearson product-moment correlation coefficients between the 19 major dependent variables 76

31. Pearson product-moment correlation coefficients between posttreatment CLDMA and CDMSAE subscores 77

32. Pearson product-moment correlation coefficients between time 1 and time 2 personal work value ratings 79

33. Means and standard deviations for time 1 and time 2 personal work values ratings 81

H-1. Means and standard deviations for pretreatment CLDMA Item 1 (define the problem) score 195

H-2. Means and standard deviations for pretreatment CLDMA Item 2 (establish an action plan) score 196

H-3. Means and standard deviations for pretreatment CLDMA Item 3 (clarify values) score 197

H-4. Means and standard deviations for pretreatment CLDMA Item 4 (identify alternatives) score 198

Page

Table H-5. Means and standard deviations for pretreatment CLDMA Item 5 (discover probable outcomes) score 199

H-6. Means and standard deviations for pretreatment CLDMA Item 6 (eliminate alternatives systematically) score . . . 200

H-7. Means and standard deviations for pretreatment CLDMA Item 7 (start action) score 201

H-8. Means and standard deviations for pretreatment CLDMA Item 8 (recycle if necessary) score 202

H-9. Means and standard deviations for posttreatment CLDMA Item 1 (define the problem) score 203

H-10. Means and standard deviations for posttreatment CLDMA Item 2 (establish an action plan) score 204

H-11. Means and standard deviations for posttreatment CLDMA Item 3 (clarify values) score 205

H-12. Means and standard deviations for posttreatment CLDMA Item 4 (identify alternatives) score 206

H-13. Means and standard deviations for posttreatment CLDMA Item 5 (discover probable outcomes) score 207

H-14. Means and standard deviations for posttreatment CLDMA Item 6 (eliminate alternatives systematically) score . . . 208

H-15. Means and standard deviations for posttreatment CLDMA Item 7 (start action) score 209

H-16. Means and standard deviations for posttreatment CLDMA Item 8 (recycle if necessary) score 210

I-1. Analysis of variance of total score on the CDMSAE as a function of treatment, sex, and class/instructor 211

I-2. Analysis of variance of "define" subscore on the CDMSAE as a function of treatment, sex, and class/instructor . . 212

I-3. Analysis of variance of "establish" subscore on the CDMSAE as a function of treatment, sex, and class/instructor . . 213

I-4. Analysis of variance of "clarify" subscore on the CDMSAE as a function of treatment, sex, and class/instructor . . 214

Page

Table I-5. Analysis of variance of "identify" subscore on the CDMSAE as a function of treatment, sex, and class/instructor . . 215

I-6. Analysis of variance of "discover" subscore on the CDMSAE as a function of treatment, sex, and class/instructor . . 216

I-7. Analysis of variance of "eliminate" subscore on the CDMSAE as a function of treatment, sex, and class/instructor . . 217

I-8. Analysis of variance of "start" subscore on the CDMSAE as a function of treatment, sex, and class/instructor 218

LIST OF FIGURES

Figure 1. Randomization design: assignment of students to treatment groups, Mt. View High School 20

2. Outcome and efficacy expectations 29

3. Total gain score on the Check List of Decision-Making Ability as a function of treatment, sex, and class/instructor 44

4. Posttreatment total score on the Check List of Decision-Making Ability as a function of treatment, sex, and class/instructor 48

5. Accuracy score on the Career Decision Simulation as a function of treatment and class/instructor 67

6. Accuracy score on the Career Decision Simulation as a function of treatment, sex, and class/instructor 69

THE EFFECT OF DECISION TRAINING ON CAREER DECISION-MAKING COMPETENCE

INTRODUCTION AND REVIEW OF THE LITERATURE

Helping people make satisfying career decisions has always been a major concern of guidance practitioners in their various work settings, and the career education movement has focused significant attention on the development of career decision-making (CDM) skills as a primary educational objective. Teaching people effective decision-making skills was identified as a major goal of counseling in a frequently cited article (Krumboltz, 1966) written more than a decade ago. Yet, despite a considerable amount of attention in this area, CDM remains an inadequately understood educational and psychological phenomenon.

Attempts to study the effectiveness or "goodness" of decisionmaking have proven difficult. In a review article, Krumboltz, Becker-Haven, and Burnett (1979) stated that the measurement of career decision-making ability must rely on some inferential processes. Currently available instruments presuppose that individuals possessing CDM skills know about occupations, are consistent in their aspirations, and have developed some kind of strategy for dealing with career-related problems and decisions. Most research has relied on measures of attitudes or knowledge about what are assumed to be appropriate career exploration activities, such as defining goals, generating alternatives, and seeking relevant information.

Data are scarce on the actual decision-making process in action (Katz, Norris, & Pears, 1978). Even rarer are experimental studies attempting to assess the effectiveness of interventions designed to develop or improve CDM skills. As in all career development outcome areas, progress has been limited by a lack of consensus on definitions and outcome criteria, a lack of adequate measurement tools, and weak design and data analysis features of the few studies that have been reported (Oliver, 1979; Super & Hall, 1978).

Career Decision-Making Models

Because the literature on career development theories and career choice is so vast, the following discussion will be restricted to those works that address the more limited focus of this research: developing an effective and testable model for acquiring and using CDM skills. But what exactly are CDM skills? Can they be specified, defined, and taught in a useful way?

Subsequent sections examine various conceptualizations of CDM skills in the form of models that depict an optimal CDM process--a set of activities designed to produce consistently desirable and preferred outcomes for the decider. These models prescribe a sequence of deliberate, planned steps or actions. Such formulations will be referred to as rational CDM models.

Prescriptive Versus Descriptive Models

Several important distinctions are necessary. First, general reviews by Becker and McClintock (1967), Lee (1971), and Jepsen and Dilley (1974) distinguish between two common approaches to conceptualizing CDM: descriptive and prescriptive models.

Descriptive models are usually theory-based and attempt to represent and predict the way in which individuals naturally make decisions. Descriptive theorists (e.g., Ginzberg, 1951; Holland, 1973; Super, et al., 1963; Tiedeman & O'Hara, 1963) are typically concerned with personality factors and developmental stages. Descriptive models are frequently explanations of the relations between vocational choice and factors such as maturity, self-concept, cognitive style, and other psychological constructs. A more recent social learning theory of CDM (Krumboltz, 1979) emphasizes genetic, environmental, and learning experience factors in describing the vocational choice process.

Prescriptive models tend to be more explicit and focus on the actual process rather than the origins of decisionmaking. Rules are specified. The intent is to provide a framework or set of guidelines that lead to a strategy applicable to a range of decision situations. Because prescriptive CDM models tend to be more concrete and outcome-oriented, they bear some resemblance to the problem-solving literature.

Rational CDM models are designed to resolve decisional conflicts and are usually couched in terms of producing better results. Thus, it is not surprising that problem solving has had a strong influence on these models' development. However, it is important to make at least a theoretical distinction. Problem-solving strategies usually apply to more tangible and circumscribed situations in which the possible outcomes can be clearly and objectively assessed. Most importantly, in problem solving the best response or option will eventually become apparent; there often is one correct solution.

CDM is necessarily a much more ambiguous operation because there are no objectively correct career choices. Each person uses a unique set of needs, interests, beliefs, and values while acquiring and interpreting otherwise objective information about alternatives. Outcomes cannot be easily quantified, and evaluation of outcomes is left to the decider. Different outcomes can be optimal for different people, depending on idiosyncratic preferences and judgmental criteria. Nevertheless, many basic problem-solving techniques, such as brainstorming and estimating costs and benefits associated with an alternative, are incorporated in models of career decisionmaking (D'Zurrila & Goldfried, 1971).

Advocates of training in rational decisionmaking contend that following the procedures specified in their models will result in making a greater percentage of satisfying decisions, regardless of the approach to evaluating outcomes. This kind of hypothesis requires some kind of longitudinal evaluation and has not been investigated to date. Problems that arise in any attempt to evaluate long-term decision outcomes are covered in a subsequent section.

Assumptions

Before examining any rational career decision-making model, it is important to review several basic assumptions. The following premises are adopted from the decision-making conceptual framework proposed by Jepsen and Dilley (1974).

First, investigators need a person faced with a career decision situation (such as selecting a program of study, a particular school, a training experience, or a job) and the availability of appropriate information. Useful information is available both within and outside the decider. It is further assumed that the decider will generate two or more alternatives for consideration, and that several outcomes or consequences can be anticipated for each alternative. For each outcome, its probability of occurrence and the degree to which it might satisfy the decider's goals could also be estimated.

A rational CDM model would guide the decider to use some kind of logical strategy to systematically eliminate alternatives. Ideally, the best option eventually would be identified, and the decider would make the necessary commitment to pursue this alternative. Other desirable characteristics for a rational model would include these steps: (a) a specification of steps, (b) an operational definition of the steps, and (c) a rationale for sequencing the steps.

An important point to make here is that not everyone approves of the traditional "rational comprehensive" approach to decisionmaking. In his famous article, "The Science of Muddling Through," Charles Lindblom (1959) argued that most choice behavior does not conform to the "normative precepts" of rational theory. He cited factors such as vaguely defined or inconsistent goals, limited information about alternatives and their consequences, and "uncontrollable contextual phenomena" as contributing to the discrepancy between theory and practice. Lindblom felt that these and other circumstances conspire to make adherence to any prescribed rational decision-making model a virtual impossibility. Given such overwhelming constraints, he suggested that decisionmakers are forced to "muddle through" their problems, relying on past experience, instincts, and good fortune. At best, he saw decisionmaking as characterized by a set of "successive limited comparisons."

Nearly 20 years later, Kritek and Colton (1978) took Lindblom's argument a step further. They consider the process of muddling through to be a desired virtue, not a lamentable necessity. Kritek and Colton advocate muddling as a normal life strategy. Their experience from 1972 to 1975 in conducting on-the-job professional development training for high school administrators convinced them of the value of avoiding prespecification of program goals and capitalizing on opportunism--that is, looking upon unforeseen events and obstacles as useful information to be accounted for and circumvented if necessary. In their view, the expectation of rationality limits the capacity to muddle through.

Another dissenting opinion from pure models of rational choice has been offered by James March of the Stanford Graduate School of Business. March, a renowned expert in decision science, organizational management,

operations analysis, and other forms of decision engineering, takes some playful yet sobering pokes at the assumption of rationality. In a recent paper, March (1978) stated,

> Rational choice involves two kinds of guesses: guesses about future consequences of current actions and guesses about future preferences for those consequences.... We try to imagine what will happen in the future as a result of our actions and we try to imagine how we shall evaluate what will happen. Neither guess is necessarily easy. Anticipating future consequences of present decisions is often subject to substantial error. Anticipating future preferences is often confusing. Theories of rational choice are primarily theories of these two guesses and how we deal with their complications....
>
> Students of decisionmaking under uncertainty have identified a number of ways in which a classical model of how alternatives are assessed in terms of their consequences is neither descriptive of behavior nor a good guide in choice situations. As a result of these efforts, some of our ideas about how the first guess is made and how it ought to be made have changed. Since the early writings of Herbert A. Simon (1957), for example, bounded rationality has come to be recognized widely, though not universally, both as an accurate portrayal of much choice behavior and as a normatively sensible adjustment to the costs and character of information gathering and processing by human beings.

March (1978) goes on to argue for the intelligence of ambiguity in decision situations. He sees a number of alternatives to calculated rationality. In discussing alternative rationalities, he suggests limited, contextual, process, adaptive, and posterior rationality concepts among others. A full discussion of each of these ideas is not appropriate here, but the need to be specific about meaning when discussing the merits of any model of rationality is apparent.

In the discussions that follow, CDM models will be called rational in the sense that they prescribe a sequence of suggested actions that can be operationally defined and have a rationale for their sequencing. This designation does not suggest that alternative models are irrational or even less intelligent--just that they are less well articulated by their advocates and less well understood by this report's authors. The models to be discussed fall short of representing pure, calculated, empirical rationality as described by March and others. They are more akin to Simon's "satisficing" principal in bounded rationality or March's notion of limited rationality. As in limited rationality, individuals making career choices inevitably simplify the problem because of difficulties in anticipating or considering all alternatives and all information. Career deciders also benefit from incrementalism and employment of simple search rules and occasionally work backward from a step in their models. They cannot, however, avoid uncertainty. In making projections or estimations about uncertain future personal preferences and economic conditions, CDM embraces aspects of the classic rational choice model.

Present State of the Art

Many authors use the word rational indiscriminately in their discussions of the CDM process. They seem to assume implicitly that a rational approach to career decisionmaking is clearly the most effective and widely used strategy. Very few of these enthusiasts list specific concepts and skills to be taught, how they will be taught, and how attainment of a rational CDM strategy can be generalized or measured.

Fortunately, some promising groundwork has been done. Gelatt (1962) offered one of the first prescriptions for engaging in rational CDM activities. Gelatt's primary interest was the use of information in making "good" decisions. His model depicts the ways in which a decider organizes information to pursue a preferred course of action toward a career goal. He suggested that at any given point the information can lead to a decision or stimulate additional exploration requiring more information. Gelatt posited three distinct information systems: (a) predictive information about probable consequences of alternative actions, (b) values regarding the decider's preference among anticipated outcomes, and (c) decision criteria for evaluating outcomes. He emphasized that good decisions require appropriate data in each of these information systems.

Clarke, Gelatt, and Levine (1965) contended that there are at least two requirements for effective decisionmaking: (a) adequate information, and (b) an effective strategy for analyzing, organizing, and synthesizing this information into a choice. However, these authors made no attempt to describe such a strategy. In a later work, Gelatt and Clarke (1967) discussed the role of subjective probability estimates in evaluating career options. All three of the above writings dealt with the characteristics of relevant information sources and how such data could be usefully organized by the decider. Gelatt and his associates were not particularly concerned with other dimensions of a rational model. They did not discuss how this elaborate information system might lead to a more comprehensive decision-making strategy.

Martin Katz (see 1963, 1966, 1969a and b, 1973, 1975, 1976, 1977, and 1978) has written extensively on the subject of making better decisions and the need for a normative CDM model. Like Gelatt, Katz seems to have concentrated on explaining a particular component of a rational CDM model. Katz (1966) suggests that the most effective CDM strategy begins with the decider generating a list of dominant personal values. These values can then be scaled according to their relative importance or magnitudes. Each value can also be assigned a threshold level reflecting the decider's personal requirements for that particular value. At this point, Katz suggests that alternative actions are formulated, and the decider should estimate the strength of return each alternative offers relative to the threshold level of each chosen value. The sum of products for strength of return and magnitude of values produces a value return figure for each option. Then, anticipated probabilities for success on each option can be multiplied by the previously calculated value return to obtain an expected value score. According to Katz, the best strategy in this logical process is to choose that alternative for which the expected value calculation is greatest. Katz's plan is a fairly elaborate procedure for dealing with the value component of a rational CDM model, but it shows no evidence as to

whether people are willing to use such a quantitative approach or how well such a strategy works.

Other psychologists have also dealt with variables relevant to prescriptive decision-making models. Edwards (1961), Edwards et al. (1965), and Kaldor and Zytowski (1969) have borrowed from the tenets of economics and behavioral decision science to demonstrate the use of utility theory in making career choices. Edwards' (1961) earlier work on his subjectively expected utility (SEU) model received considerable attention. His premise was that decision situations involve a subjective estimate of the probability that each particular alternative will achieve a given outcome, as well as a subjective determination of the value of various outcomes. Although the SEU model has been criticized for its assumption that people behave as though they always maximize the sum of products of utility and probability, the model can be a useful tool, particularly in more circumscribed decision situations. Furthermore, if a user takes into account the biases introduced by commonly used judgmental heuristics such as representativeness and availability (Tversky & Kahneman, 1974), utility models can be made more efficient.

Yet another group of authors has offered guidelines that advocate a rational, though somewhat sketchy and incomplete, CDM strategy. Several of the most relevant of these sources are Farmer (1976), Roos et al. (1974), and Weissman and Krebs (1976). Farmer's six-stage guided problem-solving model grew out of her work on the Inquiry Project, a network of computer-assisted counseling centers for adults. Her model emphasizes the identification of long-range goals, the identification of immediate subgoals, and plans for using various resources to overcome obstacles to the subgoals. The Weissman and Krebs model similarly emphasizes the importance of translating a career exploration problem into goal language and then identifying all the blocks and strengths that either hinder or help reach the goal. The model advocates creating an action plan that answers questions regarding where, when, and how to begin the decision-making process. Roos et al. also suggest a model of occupational choice that provides structure through a series of guided questions. These five questions, referred to by the authors as decision points, deal with issues such as skills, occupational requirements, rewards, probable outcomes, and needed additional information. Again, although each of these sources advocates a variant of the rational-empirical approach to making choices, none is comprehensive or well elaborated.

A recent search of the CDM literature yielded only a few comprehensive models that specify a planned sequence of steps for making career decisions. Although several authors assume that CDM skills can be identified and learned (see Gelatt & Varenhorst, 1968; Krumboltz & Baker, 1973; and Stewart & Winborn, 1973), few bother to define these skills and elaborate on them in any detail. Of the models that come close to satisfying the previously mentioned criteria, only the Krumboltz and Baker (1973) reference includes even minimal operational definitions, a rationale, and illustrative examples. Their model contains seven separate steps, listed below.

1. Defining the problem;

2. Generating alternative problem solutions;

3. Collecting information about the alternatives;

4. Examining the consequences of the alternatives;

5. Revaluing goals, alternatives, and consequences;

6. Making the decision or tentatively selecting an alternative contingent upon new developments and new opportunities; and

7. Generalizing the decision-making process to new problems.

Models of this sort provide the framework for most programs in which CDM skills are currently taught. Although such guidelines seem logically sound and have a certain practical appeal, data to substantiate their effectiveness are simply not available. Part of the problem is due to the inadequacy of the models themselves--it is hard to validate something that is inadequately defined or vaguely explained.

An even larger obstacle to evaluating the merits of any CDM model is the problem of inadequate instrumentation mentioned earlier. Researchers need to refine the validity and reliability of existing measures and develop innovative tools to tap unmeasured variables, particularly in the performance domain. Also, a lack of consensus on the meaning of basic terminology and a bewildering array of basic learner objectives further confound the evaluation picture. But despite these limitations, research on vocational development and career choice is being conducted at several different levels.

Career Decision-Making Research

A review of CDM research conducted from 1969 through 1974 (Mitchell, Jones, & Krumboltz, 1975) yielded only 45 studies of the influence of psychological factors on career decisions. These studies were dominated by two major theoretical orientations. Almost half of the studies dealt with Holland's (1973) vocational typology, while a significant percentage of the remaining investigations pursued the self-concept formulations of Super (1963) and others. Thoresen and Ewart (1976) have written a thorough analysis of the contributions and limitations of the above lines of inquiry. They emphasize the weak correlational data base and trait-state assumptions in Holland's work on vocational types and preferences. Just as problematic is the unresolved tautology that characterizes the self-concept-work roles research done by Super and his associates. To observe that self-concepts and work roles tend to be related tells us little about how these vocational identities develop and what kinds of experiences or behaviors lead to the successful realization of a job congruent with a person's self-perceptions.

An experimental approach that seeks to find influencing factors through systematic control and observation is needed. While past studies represent commendable efforts and have generated several useful guidance tools (for example, Holland's 1970 Self-Directed Search), conceptualizing vocational interests as fixed personality traits has done little to help us understand how vocational interests develop or subsequently change, and what conditions favor sound career selection.

Social Learning Approaches

Some researchers contend that career aspirations are best explained as a function of the feedback people receive from their environment, the occupational models they emulate, and the images they find associated with various work activities (Krumboltz & Rude, 1980). As people learn about work through their own experiences and resulting belief systems, counselors and teachers can play a key role in shaping those experiences and beliefs in a positive way. Research has shown that certain kinds of structured, self-guided mastery experiences can become powerful reinforcers in strengthening or increasing target behaviors. Thus, it seemed logical to assume that a successful experience in exploring a prospective job might lead to other kinds of career-related activity. Krumboltz and his associates at the Stanford School of Education (see Krumboltz, Sheppard, Jones, Johnson, & Baker, 1957; Krumboltz, Baker, & Johnson, 1968) developed a set of Job Experience Kits to study the effects on students from the chance to work at simulated tasks and problems typical of certain occupations.

Several significant findings emerged from the series of studies using the Job Experience Kits. For example, it was found that the use of the kits consistently produced more self-reported interest in a given job and more actual information-seeking than did the use of such standard job information media and formats as pamphlets, occupational briefs, and films. Furthermore, those students reinforced (given positive verbal feedback) for using certain kits did more career exploration in those job areas and reported a greater preference for related occupational activities than did students not reinforced. These results suggest that career aspirations may at least partially result from the differential reinforcement people get for engaging in certain activities or pursuing various interests as children.

A social learning viewpoint portrays career development as resulting from an individual's learning experiences. People are seen as having some power to shape their own destinies by devising learning experiences of their own choosing, by exploring compelling alternatives, and by learning a logical process of selecting the most appropriate options (Krumboltz, 1979). This theory is based on the assumption that certain conditions and events lead to the effective use of CDM cognitive and performance skills. Some preliminary findings on the relative effectiveness of a structured 90-minute training program in rational CDM did not demonstrate the superiority of a restricted application of these procedures (Krumboltz et al., 1979). It should be noted, though, that questions concerning the adequacy of such a brief treatment and certain design features of the principal dependent measure make interpretation of the above experiment extremely difficult.

Decision Styles

Many references (for example, the rational models cited earlier) imply that there is a single best or ideal model for CDM, ignoring the likely possibility that alternative approaches might be more effective for some individuals (Jones, 1976). Furthermore, the decision-making strategy advocated by these models is a highly rational, lock-step sequence approach to solving problems. Is this kind of prescription the most desirable way to teach decisionmaking?

Work by Baumgardner and Rappoport (1974) on the analytical-intuitive dimension of cognitive style used in making career-related decisions suggested that students' career choices were not necessarily reflected in rational processes. Many of their subjects showed little concern for objective or authoritative information, or for making decisions in a systematic manner. Again, however, there is no way of knowing how individuals with such predispositions fared with their decisions or how they might respond to a comprehensive CDM training experience.

Several studies on individual styles of decisionmaking (see Janis & Mann, 1977; Johnson, 1978; and Scherba, 1979) strongly suggest that decision styles are not consistent across decision situations. Variables such as perceived importance or career-relatedness, the amount of associated stress, and self-efficacy or outcome expectations may all interact in complex ways to affect how people make decisions. For example, Janis and Mann, working with a variety of populations, developed a conflict-theory model of decision-making that suggests the way people cope with resolving a difficult choice is determined by the presence or absence of three conditions: awareness of the risks involved, hope of finding a better solution, and the time available in which to make the decision. In their research they found that a person might employ any of five empirically derived decision styles (unconflicted adherence, unconflicted change, defensive avoidance, hypervigilance, or vigilance--the preferred style) depending on the characteristics of the above-mentioned conditions.

Scherba's (1979) doctoral dissertation was based on a 287-item decision-making questionnaire developed to measure actions and thoughts representing five different decision-making styles: rational, impulsive, intuitive, dependent, and fatalistic. Style inferences were derived from self-reports of the way in which five previous decisions (three career-related, two not career-related) were made. The magnitude of the correlations among styles varied with the individual decision situations and was not consistent for either the career or noncareer decision situations. In other words, decision styles for individuals varied widely across different kinds of decision situations.

Perhaps several alternative models are needed. The goal should be to approximate more realistically the role of differences in individual decision styles across various situations. People need to learn which methods work best for them under particular circumstances and for particular kinds of choices.

Also, how much do we know about how people actually make decisions? Rigorous descriptive research is badly needed. Such studies might clarify prescriptive assumptions and help identify the behavioral characteristics of successful decision makers (Thoresen & Ewart, 1976). Dinklage's (1968) doctoral dissertation is a good example of promising work in this area. She analyzed hundreds of structured interviews with high school students and identified eight discrete decision-making strategies used for personal, educational, and vocational planning. She labeled these styles impulsive, fatalistic, compliant, delaying, agonizing, planning, intuitive, and paralytic. The most common strategy used by the subjects in Dinklage's study was a planning orientation, but this approach only accounted for about 25%

of the decisions reported. However, none of the Boston-area schools participating in her research offered specific training in CDM skills, and there is no way to know about the consistency or effectiveness of these inferred styles.

Decision-Making Training Programs

A number of promising CDM skills training programs have been developed for a range of audiences. The College Board has developed Deciding (Gelatt, Varenhorst, & Carey, 1972) for elementary school students and Decisions and Outcomes (Gelatt, Varenhorst, Carey, & Miller, 1972) for adolescents and young adults. Each program provides both a leader's guide and an extensive set of exercises to acquaint users with a systematic procedure for making decisions. Loughary and Ripley's (1975) Career and Life Planning Guide and Bartsch, Yost, and Girrell's Effective Personal and Career Decision Making (1976) are two other excellent resources among many now coming on the market. Perhaps the most comprehensive training program in career decision-making skills is the one developed by Winefordner (1978) and his associates at the Appalachian Educational Laboratories.

It should also be noted that several programs have been developed with the midcareer changer in mind. Increasing numbers of people rethinking their vocational futures are seeking help with major career decisions. We are observing that individuals have a dynamic set of values that are periodically reevaluated in light of changing personal and environmental circumstances. Waters and Goodman (1977) described a CDM skills training course at the Continuum Center for Adult Counseling and Leadership Training at Oakland University in Rochester, Mich. Farmer (1976) developed the Inquiry Project, computer-assisted counseling for adults that brings sophisticated information-processing capability to the aid of midcareer changers. Also, the Programs and Practices in Life Career Development Processes (1974) produced by the APGA-Impact-ERIC/CAPS Workshop on Life Career Development contains useful curriculum ideas for a broad range of audiences.

It should be emphasized, however, that all of these resources and training procedures provide various conceptualizations of what constitutes good career decisionmaking. None provides any evidence of impact. Does all this well-intentioned expert advice actually improve the quality of decisions made by its consumers? To emphasize a key point, researchers have lacked the tools for assessing in what way and how well people make decisions. Investigators need to develop some explicit criteria for effective career decisionmaking (CDM) and then build and validate instruments that measure these criteria.

Evaluation of Decision Training

None of the prescriptive CDM models or training programs developed so far has been subjected to thorough empirical testing. However, previous research has shown that certain interventions do result in increased career-relevant behavior. Krumboltz and Thoresen (1964) and Krumboltz and Schroeder (1965) demonstrated how the use of reinforcement and model reinforcement counseling methods increased the information-seeking behavior of high school

students. Seeking appropriate information is one of the skills specified in all of the rational CDM models.

Russell and Thoresen (1976) found that using a simple set of guidelines helped children achieve a significant increase in the number of alternatives considered as well as identify more probable consequences for their actions in decision-making situations. Birk (1976) reported that high school women considered a wider array of career options, and Ferguson (1976) found improved self-reported estimates of CDM ability in community college students as a result of participating in structured CDM classes. Perhaps it is possible to devise appropriate learning experiences that will result in increased use of other CDM skills assumed relevant to career development.

The goal should be to devise a program that develops all the skills deemed important in making sound career decisions. Partial understanding and mastery of the decision-making process can be as frustrating and potentially dangerous as having only some of the skills and judgment required to drive a car. Of course, officials have developed fairly reliable assessment procedures to assure that car drivers have basic competencies. If making career decisions can be elevated to a similar level of importance, maybe investigators should begin looking for better ways to assess competencies here as well.

The Problem

Although a few studies on the impact of training programs suggest an increase in certain relevant behaviors, CDM assessment needs (a) better operational definitions of CDM skills; (b) ways to measure all components of decisionmaking, not just ways to generate alternatives and seek information; (c) procedures to observe decision-making behaviors directly, not merely through self-report; (d) ways to determine the practical effects of performing relevant CDM behaviors; and (e) to develop multiple indexes of CDM competence and specify the constructs those indexes are based on. Seeking solutions to all of these problems is beyond the scope of a single study, but several problems can be looked at simultaneously.

A major issue facing CDM research concerns the point at which to assess the quality of a decision. This issue boils down to defining what constitutes a good decision and has generated controversy among psychologists and philosophers. Varenhorst (1975) makes a vitally important distinction between a decision and an outcome:

> Many people overlook the difference between a decision and an outcome. People frequently equate a good decision with a good outcome and a bad decision as the reverse. If this is accurate then an evaluation of a decision must always be delayed until the outcome is revealed. This presents some problems because the outcomes of decisions frequently change as events occur or circumstances change.

Varenhorst's point is especially compelling in approaching the chore of evaluating career decisions. At what point in a career is it appropriate to assess the quality of decisions that led to it? Do investigators obtain measures during the first day on the job, 6 months later, 5 years later, or when? What kind of instruments are used? Can some meaningful measures of success or satisfaction be devised? Do investigators rely on self-report or on objective, externally applied criteria? As Katz (1975) points out, it would be tremendously difficult to isolate elements attributable to CDM factors in this kind of post hoc analysis. Unfortunately, reports of career satisfaction are the product of complex interactions among random variables, such as health, personal relationships, physical environment, and prevailing economic and social conditions. Add to this the fact that life values are subject to periodic change as a result of new learning experiences, and the result is a messy and unreliable measurement picture.

The problems with evaluating remote or even intermediate career decision outcomes suggest that assessment should be based on the immediate outcomes of the process or procedures used to arrive at the decision. Again, here is a quote from Varenhorst's (1975) paper:

> The critical difference between a decision and an outcome is the degree of control one has in determining each. A person has complete control over the options he chooses, perhaps not the numbers or kinds of options available to him, but complete control over the choice of those that are available to him. On the other hand he has no control over the outcome that results from what he has decided. He can think about, predict or guess what the result may be, and this requires skills, but in the end he does not control which outcome results. He does not decide his outcome.
>
> This means that decisions must be evaluated at the time of decision and on the basis of the process that was used. The process involves the careful examination of personal values, the collecting of information about alternatives, outcomes, and the probabilities of outcomes, as well as the ability to weigh all of these factors in finally making the decision.

Varenhorst argues her decision versus outcome point forcefully in the above passage and seems to not only exaggerate her case, but leaves a dilemma. First, it seems extreme to assert that deciders have no control over the outcomes resulting from their decisions. Such a fatalistic contention contradicts her advocacy and description of behaviors that facilitate the decision-making process up to the time of choice. Vigilant applications of these same behaviors at times subsequent to the actual decision will not avert chance occurrences, but will nevertheless leave a person with some measure of control in responding to and accommodating new information. Making a choice does not mean relinquishing any further influence on the destiny of its outcome.

However, Varenhorst fails to specify any procedure for evaluating decision processes (such as gathering information, examining personal values, evaluating probable outcomes, and so forth). Researchers still do not know

what kinds of processes or behaviors (used to what extent) lead to better decision outcomes. What is the point of advocating any particular approach to making decisions if there is no way to assess its comparative effectiveness?

Criteria are needed for assessing aspects of the decision-making process, but these processes should be evaluated in terms of the resulting immediate decision outcome. The authors' argument with Varenhorst implies more than a trivial semantic distinction regarding the meaning attached to the word "outcome," although part of the disagreement may arise from her more limited use of outcome to mean long-range consequences.

Using certain procedures and engaging in certain behaviors such as generating alternatives, weighing personal values, and evaluating possible outcomes can be directly linked to real consequences at the time of decision. In other words, it is quite reasonable to evaluate the outcome of a decision on its merits at the time it is made, before new information or unforeseen chance occurrences can affect subjective satisfaction with the choice. Such an evaluation is based on the decider's current state of knowledge and preferences, which, given the highly dynamic nature of both, seems to be a sensible criterion.

Of course, it would be desirable to know whether certain discrete, demonstrable, and learnable decision-making behaviors lead to better decision outcomes in the long run. Outcomes in this sense refer to actually experiencing the consequences of a choice (for example, knowing what it is like to work as a librarian 5 days a week for 3 years). This ultimate criterion of decision-making competence is difficult to relate to specific procedures or behaviors used and options identified at the time of choice for a number of reasons. First, this kind of data would have to be collected and stored in the context of a longitudinal design, as already pointed out. Second, how do researchers retrospectively evaluate alternatives not chosen? It is impossible to know what kinds of surprises, both fortuitous and unpleasant, might have been encountered on any path not taken. Finally, researchers would also be faced with the problem of applying a suitable objective criterion to assess the goodness of some ultimate career decision outcome. To avoid all the subjective bias inherent in measures of self-reported career or job satisfaction, what data should be collected? Do researchers count the number of progeny, length of obituary, size of estate, number of friends, extent of travels, number of offices held, or what? Once again, idiosyncratic values preferences arise, making it unreasonable to expect any kind of consensus on what the most important criteria should be.

For the above reasons, in this y analysis of decision outcomes was based on data generated by performance on a CDM simulation task. This procedure allows evaluation of the goodness of a career decision according to each decider's own specified value preferences, and to relate the numerical goodness of choice to quantitative measures of behaviors (such as information-seeking) used to make the decision. An implicit assumption, not investigated here, is that whatever procedures produce better immediate decisions, other ones will also produce a greater percentage of good decisions over the long run.

Indexes of Career Decision-Making Competence

What do CDM processes, CDM skills, or CDM competence mean? Researchers refer to career decisionmaking (CDM) as if it were a global concept, and previous research has often settled for attempts to obtain a single measure of this phenomenon (see Krumboltz, Becker-Haven, & Burnett, 1979; Super & Hall, 1978). Making career decisions is not much different than making other kinds of important decisions--it involves making a different choice between two or among more options. It is probably safe to assume that whenever a person is aware of a consequential decision, that awareness is felt in terms of an information deficit. This deficit can be internal, external, or both. In other words, deciders can need to know more about the following: (a) what they really want or value personally; (b) what options are available to them; (c) what the specific nature of those options might be; or (d) what the likelihood of success or satisfaction might be (both in terms of personal interests and abilities and environmental conditions) in pursuing any of the alternatives.

It seems that at the very least competent CDM requires the ability to recognize and specify personal work values and the information-processing skills necessary to acquire relevant data and evaluate realistic alternatives in light of those values or preferences. This position is similar to Katz's (1966) suggestion to regard CDM as a strategy for acquiring and processing information. He posed three questions relevant to this discussion: (a) Do students know what information they need? (b) Can they get the information they want? (c) Can they use the information they obtain?

Katz's questions suggest closely related but separate indexes of CDM competence. Such indexes, however defined, might have high positive correlations with basic verbal reasoning, reading comprehension, or perhaps even analytic reasoning scores. However, whether such correlations would result and how separate indexes of CDM would correlate for individuals in various instructional programs remain empirical questions.

A major challenge facing this research project was to derive meaningful component scores for evaluating the quality of various aspects of a CDM performance. Katz's development of the Simulated Occupational Choice (SOC) instrument (1976, 1977, 1978) represents an important attempt to construct a diagnostic measure of multiple competencies in career decisionmaking. However, a careful evaluation revealed that SOC failed to meet a number of important criteria deemed necessary for use in this research. Most notably, SOC has severely limited face validity. Thus, it was necessary to devise a considerably more complex simulation with some of the same scroring features.

Summary

Vocational planning and sound career decisionmaking remain a top concern of students at many levels of public and private education. As the economy falters and employment opportunities diminish, the pressure to make good career decisions increases accordingly. Educators, guidance personnel, and psychologists struggle to design constructive learning experiences that will facilitate the career development process.

Little is known about the nature of career decision-making procedures that lead to better outcomes. Few systematic decision training programs or models have been rigorously evaluated. Progress has been limited by the lack of performance measures yielding outcome criteria useful in either program evaluation or differential diagnosis for particular skill competencies.

METHOD

Introduction

This study was designed to investigate the effectiveness of a multicomponent training program in career decisionmaking. A seven-unit curriculum advocating a sequence of planned decision-making actions was administered in four different classes to a random half of a sample of students at Mountain View High School in Mountain View, Calif. The experiment was primarily concerned with the effects of certain learning experiences on the use of a specified set of CDM behaviors. Thus, the major independent variable consisted of the presence or absence of a CDM skills training program.

A basic assumption of a social learning theory of CDM (see Krumboltz, 1979; Krumboltz & Rude, 1980) is that decision-making skills are products of learning experiences and can be directly modified through the application of learning principles. Although systematic attempts have been made to help people develop CDM skills, hardly any research has been done to evaluate these interventions. The study reported here assessed the overall effects of providing modeling, positive reinforcement, guided practice, and appropriate resources in teaching a rational model of CDM. The goal was to assess the impact of a comprehensive curriculum and to refine some instruments useful for both differential diagnosis and program evaluation.

This research partially replicated a recent investigation (Krumboltz, Scherba, Hamel, Mitchell, Rude, & Kirnier, 1979) that tried to answer the question, "Does teaching a rational approach to CDM improve the quality of career decisions?" Krumboltz et al. tested a 90-minute treatment based on a systematic CDM process with a community college student population. Although Krumboltz and his associates did not demonstrate the superiority of their decision training procedures over an attention-placebo condition, their experiment raised a number of intriguing questions and suggested several goals for subsequent research.

Specific Objectives

The specific objectives of the study were as follows:

1. Investigate whether a prescriptive, multicomponent CDM training program for high school students would produce these results:

   (a) Superior performance scores on a simulated CDM problem;

   (b) Superior knowledge scores on a standardized, cognitive measure of CDM principles and facts; and

(c) Greater self-efficacy estimates of decision-making ability.

2. Observe how self-efficacy estimates of decision-making ability correlate with CDM knowledge and performance scores.

3. Observe how CDM performance, knowledge, and self-efficacy scores correlate with basic academic achievement data for the target population.

Experimental Design

The design used was the randomized posttest-only control group design described by Campbell and Stanley (1966) as one of the three "true" experimental designs. Several modifications were made: (a) a stratified rather than a simple randomization procedure was used; (b) one set of dependent variables--self-efficacy estimates of decision-making abilities--was assessed both before and after treatment; and (c) grade point averages as well as mathematics and reading achievement scores from the Stanford Task Battery Analysis (all obtained pretreatment) were used as covariates in computing the main effects and interactions of the design factors on several dependent variables.

The other dependent variables, assessed after the treatment, were criterion measures of the following: (a) knowledge about the facts, principles, and applications of rational decisionmaking; and (b) ability to perform in a simulated career decision situation. The independent variable was the presence or absence of a sever-unit CDM training program. Training took place at Mountain View High School in four different classes of eight students each, randomly assigned (after stratifying by sex) from volunteers in four different third- and fourth-year English classes. The four instructors responsible for the CDM training had no contact with the students assigned as matched no-treatment control groups.

Participant Population

This research was motivated by a concern about the inadequacy of efforts to assess the impact of career education programs in the nation's public schools. To measure the effects of a program designed to improve CDM efficacy, a population of older high school students (mostly juniors) was selected for several reasons.

First, these individuals have almost reached the end of a public schooling experience and have been exposed to whatever range of career education programs are offered within their school system. Such students should be prepared to integrate a number of career development concepts that culminate in the learning and application of CDM skills.

Second, older high school adolescents seem particularly concerned with exploring the personal values that are so vital in all kinds of decisionmaking. Developmentally, these youngsters are dealing with crucial experiences that shape attitudes, beliefs, and behaviors regarding gender roles; ways of relating to others; future aspirations; and

convictions about values, work, leisure, and many other things. In short, they have reached a decision-making readiness stage in their lives.

Finally, the last years of high school present an inevitable choice point--one of many they will face. Personal, educational, and vocational decisions made here (either by choice or default) have important consequences. Therefore, high school juniors and seniors represent both a practical and a clinically compelling population for assessing the effects of a decision training program. It was hoped that such a population would be especially receptive to efforts aimed at improving decision-making competence.

Sampling Procedure

Participants were obtained primarily from third-year English classes (with a few sophomores and seniors added) for the following reasons: (a) ease of access to the desired population (besides physical education, English is the only subject in which all juniors and seniors are enrolled); and (b) the strong suggestion from the school's administrators that English department faculty would be the most likely to support the study.

Students were recruited by visiting their classrooms, explaining the program, and asking for voluntary participation. Both administrators and faculty advised against conducting the CDM classes either before or after regular school hours. The teachers granted permission for students assigned to the treatment condition to attend the CDM classes once per week for 7 weeks in place of their regular English classes without suffering any penalties. This attitude of cooperation and accommodation was no doubt crucial in successfully recruiting students.

Five English teachers allowed recruitment from their classrooms. Only third- and fourth-year English classes with enrollments of at least eight male and eight female students were visited. The goal was to treat each classroom as a separate sampling pool and, after stratifying by sex, randomly assign four males to a treatment group, four to a matched no-treatment control condition, and any remaining male volunteers to a reserve pool. The same random assignment procedure was used for female volunteers.

An experimenter was introduced in five different classes who spent about 15 minutes explaining the purpose and content of the CDM training program. The experimenter also explained how volunteers would be assigned to the classes and that all volunteers, regardless of group assignment, would be asked to complete some instruments measuring their CDM attitudes, knowledge, and ability. After answering questions, students were asked to complete a consent form (Appendix A) indicating their interest in the program. Only interested students comprised the population of this study.

Table 1 summarizes the number of students in each participating class who indicated interest in taking part in the study. Only junior students were enrolled in Class 1 and Class 2, while Class 3 and Class 5 consisted entirely of seniors. Class 4 consisted primarily of juniors and a few advanced sophomores. A total of seven sophomore volunteers from Class 4 participated in the study. The total sample of students consisted of 17 seniors, 40 juniors, and 7 sophomores.

Table 1

Summary of the Number of Interested and Noninterested Students in the Five Participating Classes

English Class	Teacher Gender Course Name Period	Number of Students Indicating Interest			Number of Students Indicating No Interest	Total Number of Students	Percentage of Students Indicating Interest
		Total	Males	Females			
1	Male #1 English IIIC Period 1	17	10	7	5	22	77.3%
2	Female #1 English IIIC Period 3	13	4	9	12	25	52.0
3	Female #2 English IVC Period 3	17	10	7	1	18	94.4
4	Female #3 Orientation to College (Sophomores and Juniors) Period 4	20	11	9	7	27	74.1
5	Male #2 English IV-College Prep Period 5	4	1	3	11	15	26.7
Total		71	36	35	36	107	66.4

Assignment of Participants to Treatment Conditions

As mentioned above, the goal was to obtain one experimental and one control group, balanced by sex, from each classroom. There were good reasons for this goal. First and most importantly, there was a practical scheduling need. If students from different English classes meeting during different periods were combined to form a CDM class, then some of these students would be missing a class other than English, and special permission would be needed. Second, assigning students to a treatment group from an intact class had the advantage of building on existing familiarity, thereby reducing the amount of time needed to get acquainted and to be comfortable working together.

After collecting the consent forms in each class, the forms were separated by sex and numbered. Using a table of random numbers (Robbins & Van Ryzin, 1975), students were assigned to either a treatment or control group. Table 1 shows that assignment by simple stratified randomization within each class was not possible because not every class yielded a sufficient number of male and female volunteers.

For example, Class 4 yielded a gender-balanced control and experimental group, plus one extra female and three extra males who were placed in separate male and female reserve pools. Since Class 2 yielded an insufficient number of male students, and Class 3 yielded an insufficient number of female volunteers to stratify and randomly assign from each class separately, the two classes were combined and treated as a single pool. Two treatment and two control groups were randomly assigned from this pool after two additional male students were randomly assigned from the male reserve pool, bringing the total to 32, with 16 males and 16 females. Class 1 produced two extra male volunteers (assigned to the reserve pool) and a deficit of one female. Since there was exactly one participant in the reserve pool for female students, she was assigned to the Class 1 pool before randomly assigning subjects to a treatment and control group.

The above assignment procedure created four treatment and four control groups of eight students each, approximately balanced by sex, yielding a total of 64 (see Figure 1). However, since random assignment was done by using the consent forms, one male was mistakenly identified as a female--due to a misreading of his name--so that the total sample consisted of 31 females and 33 males.

The total reserve pools of five males and one female were created before subjects were randomly assigned to classroom pools for subsequent random assignment to either a treatment or control group. This procedure left three males in a reserve pool to replace any control males lost through attrition. One such subject was actually used to replace a control subject who moved out of the school district before the posttreatment measures were administered.

Finally, none of the four volunteers from Class 5 participated in the study. These students would have been assigned to their respective reserve pools, but the instructor expressed a preference that these few students not be used unless absolutely necessary. Enough students were recruited from other classes to make their participation unnecessary.

Class Treatments	1		2		3		4		
	Group 1 Instructor 1		Group 2 Instructor 2		Group 3 Instructor 3		Group 4 Instructor 4		
	M	F	M	F	M	F	M	F	
CDM Training	4	4	4	4	4	4	4	4	32
	Group 5 No Instructor		Group 6 No Instructor		Group 7 No Instructor		Group 5 No Instructor		
	M	F	M	F	M	F	M	F	
No Treatment Controls	4	4	4	4	5	3	4	4	32
	16		16		16		16		64

N Males = 33
N Females = 31
Total N = 64

Figure 1. Randomization design: assignment of students to treatment groups, Mountain View High School.

Table 2 summarizes the number of male and female students contributed by each participating English class, based on the random assignment procedure described on the preceding page.

Table 2

Total Number of Students Contributed by Each Participating English Class

	Treatment Condition				
	Experimentals		Controls		
English Class	Males	Females	Males	Females	Total
1	4	4	5	3	16
2	3	4	2	4	13
3	5	4	4	3	16
4	4	4	4	3	19
Total	16	16	17	15	64

Design Factors

Table 3 provides a comprehensive breakdown of the composition of each of the eight assigned groups by sex and English class of origin. From this table it is clear that the 2 x 2 x 4 design has two levels each for the sex of subjects and treatment condition factors. The third factor is somewhat less clear-cut.

Table 3 reveals that the control and experimental groups are roughly matched in terms of the three separate sampling pools from which they were randomly assigned. For instance, all experimentals and matched controls in Groups 4 and 8 were recruited from the same classroom. The same can be said about Groups 1 and 5 except for one control subject. Groups 2, 3, 6, and 7 were all assigned from the same sampling pool (combined Classes 2 and 3). Groups 2 and 6 and groups 3 and 7 are matched with the exception of one subject in control Group 7 and two subjects in control Group 6.

The instructor variable was deliberately confounded with the class of origin variable because there was no psychological interest in the main effects of either variable. This combined variable constitutes the third factor, class/instructor, with four levels for each of the matched experimental and control groups. In other words, level one represents Groups 1 and 5; level two, Groups 2 and 6; and so on. Any main effects for class/instructor might be due to the influence of the instructor, the class(es) from which students were recruited, or possibly some interaction between the instructor and the class of origin variables. Thus, the 2 x 2 x 4 design used in this study reflects two levels each for the treatment condition and sex of subjects and four levels for the combined class of origin and instructor factor abbreviated class/instructor.

Table 3

Number of Participants by Sex and Class of Origin
for Experimental and Control Groups

Experimentals				Controls			
Group	Males	Females	Class	Group	Males	Females	Class
Group 1	4	4	1	Group 5	4	3	1
(Instructor 1)						1	4
Group 2	1	2	2	Group 6	1		1
(Instructor 2)	3	2	3			2	2
					2	2	3
Group 3	2	2	2		1		4
(Instructor 3)	2	2	3				
				Group 7	2	2	2
Group 4	4	4	4		2	1	3
(Instructor 4)					1		4
				Group 8	4	4	4
Total	16	16		Total	17	15	

Instructors

The four instructors who administered the CDM skills training program were students at Stanford University. Table 4 provides relevant information on their backgrounds.

All instructors participated in the design and planning of the instructional curriculum. For several months prior to the beginning of instruction and throughout the training program, weekly planning meetings were held to discuss and rehearse the training activities and exercises. These sessions insured both a certain amount of instructor practice and preparation and reasonable uniformity in delivery of the treatment.

Experimental Treatment

This experiment was concerned with the effects of certain learning experiences on the use of a specified set of CDM behaviors. The major independent variable consisted of the presence or absence of a training program on decision-making skills. The program involved seven weekly meetings of about 1 hour each, plus a variety of homework assignments. This basic model taught was that when a decision situation occurs, it is often helpful to approach it in a sequential series of steps that will enable the decider to reduce the levels of complexity and ambiguity and deal with the decision in an orderly fashion.

Table 4

Information About CDM Skills Training Program Instructors

Instructor	English Class(es) Students Assigned From	Sex	Age	Education	Previous Secondary School Counseling Experience
1	Class 1 English IIIC Period 1	F	21	College Senior Psychology Major	None
2	Class 2 English IIIC + Class 3 English IVC Period 3	M	30	2nd yr. Ph.D. Candidate Counseling Psychology	None
3	Class 2 English IIIC + Class 3 English IVC Period 3	M	32	4th yr. Ph.D. Candidate Counseling Psychology	3 years
4	Class 4 Orientation to College Period 4	M	28	3rd yr. Ph.D. Candidate Counseling Psychology	1 year

The DECIDES Model

The conceptual model prescribing steps to be followed in CDM situations evolved from an earlier strategy defined by Krumboltz and Baker (1973) and was later modified to consist of the following steps described by Krumboltz and Hamel (1977):

1. Define the problem. Students were taught how to recognize that a problem exists and how to state a problem in terms of some specific date by which time a decision must be reached. Emotional influences on decisionmaking were considered at this first stage and at all subsequent phases of decisionmaking. Many people dislike planning for the future and procrastinate in taking steps to make decisions. Others find it painful to even consider eliminating some options from further consideration--they fear some eventual regret over what they might be giving up. Students were urged to anticipate future problems and encouraged to set a date by which a decision must be made. Resistance to the process of decisionmaking is at least partially due to an absence of knowledge about ways to do it efficiently and confidently.

2. Establish an action plan. Students were taught that the importance of the consequences of a decision largely determines the amount of time and effort to be devoted to making that decision. Important decisions that can be anticipated in advance deserve greater resource allocations than do minor decisions or decisions that must be made within a short time. Learning to discriminate those decisions with potentially important repercussions is almost a skill in its own right. Students were shown how to budget time and resources for each of the decision steps relevant to a variety of choices they were currently making. The plans they made to accomplish the decision process were considered a tentative guide for action, not a final commitment. Students learned how to set reasonable deadlines for completion of each step in their plans and were given the expectation that a series of steps often needs to be recycled several times in order to arrive at a satisfactory final determination.

3. Clarify values. Students were taught that their own personal values provide the criteria by which they can judge the possible alternatives under consideration. A problem can be decided to the satisfaction of the decider best when that decider's values have been thoughtfully examined and clearly stated. Ways of discovering values were described and modeled, and experiences were provided for students to help them discover their own values through various exploratory and record-keeping activities. Students were asked to write a summary of their most important values and led to recall experiences that indicated the types of events that create an awareness of values or cause values to change. Instructors pointed out that each student's values, having changed in the past, may also change in the future in unpredictable ways. It was emphasized that for most major decisions no single alternative can be expected to satisfy all values. Students were taught how to rank values in order of importance and make compromises that maximize attainment of their highest priorities. Exploring benefits (and costs) experienced from prior decision situations often leads to the uncovering of previously unrecognized values.

4. Identify alternatives. Students were taught to anticipate that more than two alternatives exist in almost every decision-making situation. A variety of resources can be used to generate additional options, and students were given the opportunity to become familiar with some of these resources, particularly those available in a Career Resource Center. Exercises were provided in which students generated creative alternatives to decision-making problems. Again, to emphasize the necessary flexibility of the model, it was pointed out that value preferences are often realized while searching for alternatives.

5. Discover probable outcomes. Students were taught that the values stated in Step 3 can be transformed into questions useful for evaluating options generated in Step 4. Finding the answers to these questions is the purpose of Step 5. In essence, students were taught how to evaluate the likelihood that each of their important values would be realized through each alternative under consideration. Instruction was provided in acquiring and evaluating relevant information. Emphasis was placed on judging individual abilities and interests relative to those characteristics of people presently engaged in career options that seemed attractive. Students were taught to recognize biased and inaccurate information and to estimate probable future occurrences in the career marketplace. Decisions are nearly always made under conditions of uncertainty, but ways of reducing the degree of uncertainty represent a skill that can be learned.

6. Eliminate alternatives systematically. Students were taught that there are various ways of arriving at optimum decision alternatives. Some possibilities include the following: (a) eliminating least desirable alternatives one by one until the remaining alternative constitutes the tentative choice; (b) selecting two or three of the most promising and feasible alternatives for intensive study; or (c) assigning importance weights to personal values and subjective probability estimates to each alternative (estimated likelihood that the alternative can or will be realized), so that the sum of weight x probability products for each alternative provides a quantitative estimate of its relative attractiveness. Individuals were encouraged to adopt the particular strategy that works best for them in a given situation. The problem of making risky decisions was considered, and students were taught that the alternative having the greatest chance of success is not necessarily the one they may wish to choose. Fallback plans can and should be developed in case the first choice alternative does not succeed. An attitude of healthy skepticism about future predictions was encouraged. Finally, it was pointed out that when alternatives cannot be eliminated on the basis of currently stated values and information, either other values need to be considered, additional information needs to be collected, or the alternatives are in fact equal.

7. Start action. Students were taught that a decision is more than a cerebral operation--deciders must put the decision into action. Decisions are not truly made until they are implemented. Emphasis was placed on accepting responsibility for the consequences of acting on decisions. Ideally, these seven steps could be generalized and applied to many kinds of decisions that students in the target population typically make.

The initial letters of each step of this seven-step procedure combine to spell DECIDES, a useful acronym to help students remember the sequence

of actions. Throughout the training period, however, students were advised to avoid a rigid adherence to the prescribed sequence of steps in the model, but instead to develop a personally meaningful procedure for making decisions systematically. See Appendix C, Student's Workbook, for brief operational definitions and concrete examples of each of the DECIDES steps.

Treatment Features

Behavioral objectives and lesson units for a multicomponent curriculum reflecting the DECIDES strategy were developed. The general format for the CDM skills training included a combination of (a) didactic explanations of the concepts being taught, (b) demonstrations of how the skills can be applied to real life situations, (c) guided practice on simulated problems, and (d) opportunities to perform the skills independently. This last component is probably the most crucial, and emphasis was placed on identifying important decisions of current relevance for practicing decision skills training.

Instructors used modeling and positive reinforcement techniques and provided resources in accordance with Propositions IIA1, IIA2, and IIA3 of the Krumboltz (1979) social learning theory of CDM (see Appendix B) but made no attempt to analyze the differential effects of particular treatment components at this time. The goal was to discover whether an overall effect could be demonstrated before attempting to isolate the contributions of separate components.

A variety of structured exercises and assigned activities was included in a student's workbook (see Appendix C) to supplement the group instruction. Individual units from a number of existing programs were adapted to meet the DECIDES model guidelines. Materials were developed based on programs devised by Hamel and Davison (1974); Ferguson (1976); and Gelatt, Varenhorst, Carey, and Miller (1972). Major topics, not necessarily in sequence, included recognizing and anticipating significant decision situations through discrimination training, clarifying values and conducting self-assessment, identifying and using worthwhile informational resources, using objective data and subjective impressions to evaluate possible options, exploring a reduced set of attractive alternatives firsthand, changing inaccurate self-attributions and occupational stereotypes, and restructuring the personal environment to increase the likelihood of engaging in desired decision-making behaviors.

Lesson Unit Summaries

Investigators prepared structured and detailed lesson plans (see Appendix D) for each of the seven training sessions. The following brief summaries provide an overview of the experimental treatment.

Session 1. The three objectives of the first meeting were to (a) make introductions and get acquainted, (b) distribute workbooks and provide an overview of the program, and (c) introduce the DECIDES model. An icebreaker exercise was used to get students acquainted and to suggest the possibility of learning through shared experiences. The instructors reviewed the program

and the model and encouraged students to come up with a major decision to work on throughout the program. Emphasis was placed on identifying problem situations and distinguishing important decisions.

Session 2. The objectives of this session were to (a) review homework exercises, (b) see that each student had an appropriate major decision to work on, (c) provide guided practice with the DECIDES model by involving the group in a fictitious checking account decision, (d) give students practice in formulating problem definitions, and (e) review Step 1 of the model.

The guided practice of choosing a bank at which to open a checking account allowed students to experiment with each of the steps of the model and to see the model used in actually making a decision.

Session 3. The primary objective of this lesson was to introduce an action plan for decisionmaking. The class was divided into pairs who helped one another set up an action plan for their major decisions, allowing the instructor to circulate and provide individual attention. As with each of the preceding sessions, homework was assigned to tie up topics covered in class and prepare for the next session.

Session 4. The objectives of this session were to (a) help students understand the concept of values and how values affect our lives, (b) provide an exercise to help students begin clarifying their own values and recognize strategies for doing so, (c) enable students to see the influence of values on the decision-making process, and (d) have students participate in a forced-choice structured exercise in which they must not only make some decisions as a group member but must also communicate and even defend their preferences to other group members.

Students were introduced to the concept of work values. Discussion was focused on various work values and activities to engage in to understand or clarify those values. The class was then divided into two groups to participate in the Fall-out Shelter values clarification exercise (see Appendix C). For homework, students were asked to interview someone they admire to find out what is important to that individual in his or her work.

Session 5. This session was used as an orientation to the school's Career Planning Center. This orientation was conducted primarily as a means of helping students identify and use relevant information sources. The Career Planning Center at Mountain View High School has an excellent computerized information search system, with files on colleges, financial aid, and careers. Students were encouraged to make use of all relevant and available information there and to become familiar with the computer's capabilities.

Session 6. The objectives of the sixth lesson were to (a) introduce the grid system, an organizational heuristic for systematically comparing alternatives by gathering information about personal values; (b) offer guided practice with the grid system on a fictitious student's summer job decision; (c) familiarize students with Step 5 of the model; and (d) introduce an occupational experience exercise wherein students could apply CDM skills in selecting one of 20 part-time jobs.

The organizational grid is potentially one of the most helpful guides for decisionmaking; therefore, considerable time was spent allowing students to both familiarize themselves with the grid and practice using it independently, particularly on their personal major decisions. There was not sufficient time to introduce the occupational experience exercise.

Session 7. Much class time was spent on administrative matters: administration of the Check List of Decision-Making Ability, class evaluation, handing in workbooks, and so forth. In addition, instructors attempted to sum up and provide closure on the DECIDES model of career decisionmaking. Students were asked to share any tentative solutions to their major decision problems and give their impressions about the usefulness of applying the model to their particular problems.

Instruments

Three criterion measures were used to assess the effectiveness of the CDM skills treatment. The Check List of Decision-Making Ability (CLDMA), administered before and after training, measures attitudes and feelings about an individual's ability to perform certain decision behaviors and provides data from the affective domain. The Career Decision-Making Skills Assessment Exercise (CDMSAE) measures knowledge of facts and procedures relevant to CDM and is therefore a cognitive instrument. Performance domain data were generated by the Career Decision Simulation (CDS), an instrument that assesses how well a person performs a simulated decision task.

Check List of Decision-Making Ability (CLDMA)

The CLDMA is a self-rating form adapted (and greatly modified) from an instrument reported by Ferguson (1976). It consists of eight items asking users to estimate their ability, compared with the average person of their age, to perform certain decision-making behaviors. Estimates are made using scales of 1 (poor) to 9 (excellent). The first seven items each correspond to one of the seven steps or actions represented by the previously described DECIDES model. The eighth item relates to ability to be flexible and recycle through the various CDM steps and asks people to estimate how well they are able to reconsider a decision when none of the present alternatives seems acceptable. Below each item on the CLDMA is a concrete example of the decision-making behavior represented by that item (see Appendix E).

The CLDMA was designed to elicit self-efficacy estimates of CDM ability. The concept of self-efficacy is an important element in the social learning theory analysis of CDM. Bandura (1977) has discussed extensively the notion of self-efficacy and its relation to performance. Although most of his research has focused on changing fearful, avoidant behavior (see Bandura, Blanchard, & Ritter, 1969; Bandura, Jeffrey, & Gajdos, 1975; Bandura, Adams, & Beyer, 1977), Bandura's work is relevant here.

According to Bandura, efficacy expectations are presumed to affect the level of performance on a given task by influencing the intensity and persistence of effort. He contends that psychological procedures can serve to

create and strengthen personal efficacy expectations. His use of various participating modeling techniques has proven dramatically effective with snake phobics.

Bandura makes a distinction between outcome and efficacy expectations (see Figure 2) relevant to this study. Outcome expectations are estimates that performing a certain behavior will lead to a desired outcome. Efficacy expectations, though, are beliefs that one can successfully execute the behavior required to produce the outcome. Thus, expectations of self-efficacy, because they come before the actual behavior, affect both the initiation and persistence of that behavior (Bandura, 1977). Accordingly, people tend to involve themselves in activities they think they can handle.

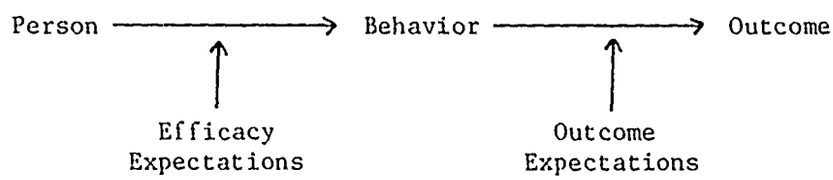

Figure 2. Outcome and efficacy expectations (after Bandura, 1977).

Although self-efficacy estimates have been shown to be powerful predictors of actual ability in a number of performance areas, no research has related self-efficacy estimates of CDM ability to actual performance. The CLDMA was constructed to meet this need and also to assess how focused training in CDM might affect self-efficacy estimates of CDM ability.

Finally, the CLDMA can also be construed as an instrument that addresses several of the key components of the Krumboltz (1979) social learning theory of career selection. In effect, the Check List items ask respondents to make self-observation generalizations (SOGs) based on previous learning experiences about their ability to perform certain task approach skills (TASs). Krumboltz defines a SOG as an "overt or covert self-statement evaluating one's own actual or vicarious performance in relation to learned standards" (Krumboltz, 1976). He defines TASs as "cognitive and performance abilities and emotional predispositions for coping with the environment, interpreting it in relation to self-observation generalizations, and making overt or covert predictions about future events. TASs include . . . skills in value clarifying, goal setting . . . alternative generating . . . eliminating and selecting alternatives, planning, and generalizing" (Krumboltz, 1976). In other words, the CLDMA asks its users to make some metric SOGs about their ability to perform some specified CDM task-approach skills.

Whether we refer to the underlying psychological concept as self-efficacy estimates or self-observation generalizations is fairly unimportant. What does matter is how such CLDMA estimates relate to a performance measure and how such estimates are influenced by a CDM training intervention.

Career Decision-Making Skills Assessment Exercise (CDMSAE)

The College Board's CDMSAE of the Career Skills Assessment Program (1977) consists of 60 multiple-choice questions. The items are designed to measure the extent to which individuals can identify the facts, principles, and applications of rational decisionmaking. Situations described in the exercises "suggest that career decisionmaking is an ongoing process, that choices are reversible, and that changes in a person's circumstances or values may bring about the need for new decisions" (The College Board, 1976). The CDMSAE provided an objective measure of knowledge about effective decision-making procedures.

Item specifications for the particular abilities and objectives that serve as the basis for the CDMSAE are categorized under the steps of the DECIDES model. Grouping items by discrete categories permits the generation of seven subscores that are useful both for differential diagnosis and for program evaluation. Also, the use of the DECIDES system as an organizational construct for the CDMSAE provides researchers with a convenient, theory-based conceptual framework for interpreting data gathered in evaluation studies.

Readers are referred to the Career Decision-Making Skills Exercise Booklet (The College Board, 1977) for a look at the items comprising the CDMSAE, and the Guide to Career Decision-Making Skills (Krumboltz & Hamel, 1977) for the item explanations. It should be noted that the CDMSAE was piloted extensively by the College Board's five-state (Georgia, Maryland, Minnesota, New Jersey, and Ohio) Career Education Consortium. The cooperation of state education agencies in these five states enabled the exercise to be administered to a large and representative sample of students in grades 10, 11, and 12--the same population used in the study reported here. Statistical characteristics of the CDMSAE, including score precision, item analysis, speededness, and validation, are covered in depth in Part B: Technical and Other Considerations, of Implementing the Career Skills Assessment Program (The College Board, 1978).

Career Decision Simulation (CDS)

A major challenge facing educational researchers is developing a means to assess the quality of career decisions. Although psychologists make frequent reference to the desirability of an objective criterion for successful career decisionmaking, no such measure is available. This project's goal was to creat an analog device that would capture as many of the complex dimensions of CDM as possible and also yield objective measures of CDM efficacy.

A simulation device was needed that would meet the following specifications:

1. Provide an objective, standardized procedure for assigning a numerical value to the outcome of a participant's job decision--a degree of goodness score;

2. Represent real-life CDM as closely as possible--high face validity;

3. Deal with a variety of personal work values dimensions;

4. Provide a recording system to track a person's decision-making behavior--both record and preserve the cumulative, sequential information on how the simulation was used;

5. Be noncompetitive and compatible with independent use--require only one person's participation at a time;

6. Be reasonable to complete within a 90-minute time limit;

7. Be self-contained; and

8. Be stimulating, easily understood, and unbiased with regard to age, race, or sex.

Although both the Life Career Game (Boocock, 1967) and SOC (Katz, 1976) contained features attractive for this research project, neither simulation adequately met the above specifications. Thus, it became necessary to design and construct an appropriate device.

The Career Decision Simulation (CDS) is the criterion instrument developed to measure CDM behavior. It is a second-generation simulation of a CDM problem, modified from a previous study (Krumboltz et al., 1979) to enhance its face validity and make it more sensitive to various ways of searching, using, and recording information about occupations. The principal change involved elimination of devices called job strips that inadvertently taught a rational approach to using the simulation as well as provided a handy and unrealistic recording system. The CDS not only provides a standardized procedure for assessing the quality of a career decision through the use of objective, numerical scoring systems, but it also provides data to make inferences about a person's decision-making style. Thus, users can gather information about both decision-making processes and outcomes and see how these data correlate for individuals with varying decision-making predispositions who have been exposed to different instructional treatments.

The CDS's basic rationale is that good decision makers interpret information accurately and are able to make decisions that yield consequences consistent with their own values. Participants are allowed up to 90 minutes to pick one of 12 fictitious occupations that most nearly satisfies their values. Some 333 separate bits of information organized into 10 different information sources are available on cards or audio tapes. The information was designed so that for each of 1,680 possible value preference configurations generated by a forced values rating task, the goodness rank order of the simulation's 12 fictitious occupations can be quickly determined.

Participants could adopt any particular type of decision style and still be able to make a good choice. They could exclusively or fatalistically choose their preferred occupation immediately without surveying any of the occupational information, or they could spend up to 90 minutes searching and thinking.

In its previous form, the CDS yielded only a single measure of CDM competence (Krumboltz et al., 1979). This criterion might be called values congruence--selecting an alternative that maximizes personal values. A major goal of the present study was to modify the CDS scoring procedure to yield additional and equally valid indexes of CDM competence. These other performance criteria are (a) accuracy in interpreting information relevant to an occupational choice, (b) thoroughness of information search on most highly prized values, (c) an additional values congruence score based on a forced choice rating task administered about a month before participants used the CDS, and (d) self-tested confidence in the goodness of the decision.

The rationale for the accuracy score is that good decision makers interpret the information they use correctly and use some system for remembering or recording their observations about alternatives when necessary. The score is derived from the value level ratings participants assign to a set of nine work values on the Job Rating Form (see Appendix G) for the occupation they have chosen. Since all 12 of the CDS's occupations have been assigned real value level ratings (as reflected by their descriptions on information units) the score is based on the extent to which participants' ratings match the assigned or intended ones. Accuracy scores can range from 10 to 85, with 85 representing perfect accuracy. That is, those scoring 85 were able to assign the intended value level ratings to all nine of the values for their chosen occupation. The computational procedure and actual scale used are explained in Appendix G, the CDS Administrator's Manual.

The thoroughness of information search score is not a totally independent criterion, since it potentially influences both the accuracy and values congruence scores. However, the rationale for a thoroughness score as an index of CDM competence is compelling and practical. It makes sense to spend the greatest amount of time and effort in gathering information about those aspects (work values) of a job setting a person rates as most important. A forced values rating task administered immediately after participants choose an occupation requires them to rate three values as being most important to them. The thoroughness score reflects what percentage of all information units used during a CDS performance provides job information related to their three most important values. Scores range from zero to 100, with 100 indicating that all the information sought was relevant to their three high values.

The values congruence scores are based on the degree of fit between the assigned work value levels of the chosen occupation and forced choice work value ratings reported at two different times. As mentioned, the rationale here is that good decision makers choose alternatives consistent with their expressed value preferences. An additional assumption of the scoring system (see Appendix G) is that it is most important to match high values, somewhat less important to match medium values, and least crucial to match lowest rated values.

A Time 1 paper-and-pencil values rating task was administered about a month before subjects used the CDS. The Time 2 rating task occurred immediately after choosing a CDS occupation and was identical except for the use of a wooden form and pegs instead of paper and pencil.

Thus, two different values congruence scores were generated for each participant, allowing possible inferences about the utility of value preferences, and the influence of a recent choice on value preferences--rationalizing an occupational choice by rating work values in a way consistent with the occupation's perceived characteristics. The scoring system for translating the degree of fit between the assigned work values of an occupation and a participant's value preferences is contained in Appendix G. This scoring system produces raw scores that are then transformed to rank order of goodness scores to indicate how close students came to choosing the occupation most similar to their value preferences (12 = best possible choice, and 1 = worst possible choice of all available alternatives).

The confidence score is based on participants' judgments as to how likely their chosen occupation represents the best one formed among the 12 available. They rate their confidence on a scale of 1 to 10 (10 = very confident) immediately after choosing an occupation. It was assumed that better decision makers would express more confidence in the goodness of their choices.

In the descriptions that follow, the reader will find it useful to refer to Appendix F, Directions for the Career Decision Simulation, a transcript of the Directions tape for students, and Appendix G, the Career Decision Simulation Administrator's Manual. To use the simulation, players begin by reading a directions card labeled "Start Here," which acquaints them with their purpose and directs them to listen to further orientation and instructions on the Directions tape. The "Start Here" card is reproduced below.

START HERE

You are about to make a major career decision--but only as part of a simulation exercise. You will find the process both educational and fun.

You are to pretend that you want to decide on your life's work, or at least the job you want to try next. Try to approach this task in the way you would really decide on a career.

This simulation exercise is self-explanatory. Your next step is to find the cassette tape labeled "Directions" above Tape 1 in the Cassette Tape Holder. Insert this tape in the tape player, push the "Play" button and follow the directions you will hear.

The Directions tape elaborates further on the simulation's purpose and reviews its components and explains how to use them. In addition to explaining the mechanics of using the device, the tape provides all participants with a uniform orientation. Participants learn procedures for using the following nine informational resources:

Book or magazine:	information from a wide variety of books and magazines.
Career handbook:	information from occupational dictionaries and career guidebooks.
Career speaker:	information from speeches given at a local career night presentation or classroom.
A friend:	information from conversations with friends.
Horoscope:	information from horoscopes written daily for an astrological sign.
Newspaper ad:	information from classified advertisements or want ads found in a daily newspaper.
Personal experience:	information gained from possible personal experiences with jobs and careers.
Radio or TV:	information from a variety of radio or television programs and commercials.
Worker interviews:	information from talking with persons actually working on various jobs.

Participants are also told that the information contained in these sources is organized by occupations and by a set of work values. These work values are almost identical to those used by Katz (1973) in his work on SIGI and are listed here: early entry, helping others, income, independence, leadership, leisure, prestige, security, and variety.

The Directions tape then points out that a set of Value Definition cards is available to players who wish to clarify the meaning of any of the CDS's nine personal work values. Both sides of one Value Definition card are reproduced below.

What does the value of "Independence" mean?	
328	234000

Independence is the extent to which you make your own decisions and work without supervision or directions from others.

If your occupation offers high independence, you would be your own boss.

Low independence would mean working under close supervision carrying out the decisions of others.

The subjects are repeatedly informed that the object of the CDS is to pick one of the available occupations that gives them the most of the things they really want in a job. The 12 possible fictitious occupations were given the following names: breandist, deptician, geebist, hister, jepist, kralician, onician, plinder, quentic, splacker, tasindic, and zampic.

Players' actions are recorded by requiring them to place each card they read into the Card Return box. Thus for each CDS participant, data on the amount, particular kind(s), and sequence of information used in making a simulated career decision are available for subsequent analysis.

Players stop performance on the CDS whenever they wish, up to the 90-minute time limit allowed. Actual performance is ended by writing the name of the selected occupation on the Job Decision card, and, as with all other cards, placing this card in the Card Return box.

After players fill out and deposit the Job Decision card, they are asked to complete two rating tasks. The first task involves rating the nine work values for the occupation just chosen as either high, medium, or low. This task is done on a device called the Job Rating Form (see Appendix G), a wooden strip with indentions next to the nine labeled work values used in the CDS. Subjects are provided with color-coded, wooden pegs labeled H for high (blue), M for medium (red), and L for low (yellow), which are placed into the indentations on the Job Rating Form to indicate judgments about the level of each value for the chosen occupation. These data are then used to compute an accuracy score to reflect how accurately the subjects interpreted the information used in making their career decisions.

The second rating task (administered after all materials from the first one are removed) asks players to rate this same set of nine work values in a way to represent an ideal or best possible kind of job for them. However, an added restriction on this task requires them to rate three of the values high, three medium, and three low. An almost identical wooden strip, called a Personal Work Values Rating Form (see Appendix G), is used for this forced rating task. Only the instructions at the top of the form are different, and the same wooden pegs are used to record value preferences.

Data generated by this second rating task, together with data generated 4 weeks earlier by the same exact task administered in a paper-and-pencil format, are used to create the values congruence scores mentioned earlier and discussed under "Results" in this report.

Information about the fictitious occupations is organized within each of the nine sources described earlier. Each source contains information about three different values for all 12 occupations. Thus, a participant has 324 separate pieces of occupational information from which to choose, or 36 per information resource. For six of these sources (book or magazine, career handbook, a friend, horoscope, newspaper ad, and personal experience) the information is written on 3" x 5" index cards. The cards are contained in separate boxes for each source, indexed alphabetically by job, and within each job alphabetically by the three different values represented there. Both sides of two representative cards are reproduced below.

A Friend	Breandist	Independence
109		101344

"A friend tells you that one of the characteristics of breandists is that they are able to run their own affairs, make their own decisions, and 'sink or swim' based upon the decisions they make. He says they are not closely supervised."

Personal Experience	Deptician	Leisure
220		102367

"While working at the Big Blue Sky Resort area last summer you had a chance to meet and talk with many of the vacationing guests. You were struck by the large number of depticians spending their vacations there. You also learned that many of these depticians visited the resort 2 or 3 times a year, and usually for several weeks at a time."

There are also 3" x 5" index cards arranged in the same fashion for the three audio sources--career speaker, radio or TV, and worker interview. However, these cards refer the player to the appropriate cassette tape containing information for that particular source, occupation, and value. The entire set of cassette tapes is housed in two labeled, revolving carousel storage units that hold 108 job information tapes (36 per information source) and the Directions tape.

A computer-assisted calculation of the CDS scoring key for values congruence scores resulted in a computer printout on 95 8-1/2" x 11" pages. This key provides a handy way for the administrator to quickly determine a participant's values congruence scores on the CDS. The key is systematically arranged to display the 1,680 different ways a subject can assign three high, three medium, and three low values from a set of nine different work values. For each of these 1,680 possible value level configurations, a raw score based on the CDS's scoring system (see Appendix G) is provided for all 12 of the fictitious occupations from which participants must choose. Thus, a participant's score can be looked up in the printout

simply by knowing the ratings on the Personal Work Values Rating Form and the name of the occupation written on the Job Decision card. Raw scores are transformed to create rank-order scores with a range of 1 to 12. A score of 12 represents the occupation with the highest raw score of the 12 available--the occupation that best matches the participant's value preferences.

The actual designing and production of the CDS posed several considerable challenges. Since several CDS units were needed to complete data collection in the field, professional assistance was sought. The Medical Graphics Department of the Stanford University Medical School was asked to help design and produce most of the major components of the CDS. It was decided that a hardwood (ash) would be the best medium for making the Personal Work Values Rating Form, Job Rating Form, High Pegs, Low Pegs, Medium Pegs, and 11 Card Boxes (9 information sources, Value Definitions box, and Card Return box). Graphics in the form of lettering, thematic pictures, silk-screening, paint, and varnish were applied to the various pieces of each CDS unit.

Making multiple copies of the CDS involved other considerations as well. Of primary concern was the need to have a sufficient supply of the 336 informational and administrative cards needed for each player's performance on this criterion instrument. After considering the problems of recording, sorting, and returning the cards to their appropriate locations after each administration, a decision was made to have a complete deck of 336 cards printed, indexed, and collated for use with each player. Thus, 70 card decks were prepared for the CDS administration. Since three of the simulation's information sources (career speaker, radio or TV, and worker interview) contain cards that direct a player to listen to a numbered cassette tape, it was also necessary to reproduce and label additional copies of each of the 109 audio cassettes.

RESULTS AND DISCUSSION

Results are summarized in this section under each major research hypothesis. The following main dependent variables were analyzed for differences between the control and experimental groups: (a) self-efficacy estimates of decision-making ability, (b) knowledge of rational career decision-making facts and procedures, and (c) performance on a simulated career decision problem.

The Stanford Center for Information Processing provided facilities for data analysis. The following Statistical Package for the Social Sciences (Nie et al., 1975) programs were used to analyze the data: Frequencies, Condescriptive, Crosstabs, Breakdown, Pearson Corr, Scattergram, ANOVA (and covariance analysis), and Regression. Specific analyses are reported as they apply to the following hypotheses.

Research Hypotheses

Directional hypotheses were derived from the previously stated objectives and research questions and are listed below under each of the three major outcome measures.

I. Self-efficacy estimates of decision-making ability

1. Students in the treatment groups will report higher self-efficacy estimates of decision-making ability total scores than will controls on the posttreatment administration of the Check List of Decision-Making Ability (CLDMA).

2. Treatment students will obtain higher self-efficacy estimate total gain scores on the CLDMA than will control students.

II. Knowledge of career decision-making facts and procedures

3. Treatment students will score higher than control students will score on knowledge of decision-making facts and procedures as measured by total scores on the College Board's Career Decision-Making Skills Assessment Exercise (CDMSAE).

4. Treatment students will score higher than control students will score on each of the seven subscore skill areas comprising the CDMSAE total score.

III. Performance on a simulated career decision problem

5. Treatment students will obtain higher scores than will control students on the following decision-making performance criteria assessed by the Career Decision Simulation (CDS): (a) values congruence, (b) thoroughness of searching relevant information, (c) accuracy in interpreting information, and (d) self-rated confidence in the goodness of the decision.

All of the above hypotheses were rephrased in the null form for purposes of statistical analysis. Main effects and interactions of the major independent variables (treatment, sex, and class/instructor) were analyzed for their contribution to scores on the criterion measures. Also, complete correlational analyses were performed to discern any meaningful relationships among the dependent variables.

Interactions and Main Effects

The following sections summarize the data for the major experimental findings. Main effects data are reported as group means, standard deviations, and t-values or F ratios with their corresponding statistical significance levels (p values). Interactions reflect the 2 x 2 x 4 scope of the factorial design, with two levels each for treatment condition and sex of participant and four levels for class/instructor. Analysis of both variance and covariance procedures was done to analyze main effects and first- and second-order interactions.

The Effect of Training on Self-Efficacy Estimates of Decision-Making Ability

The Check List of Decision-Making Ability (CLDMA) was judged to be the least reactive criterion measure and was therefore the only instrument

administered both before and after the experimental treatment. The CLDMA is an eight-item, self-rating measure that asks respondents to estimate how they would rate their ability to perform certain decision behaviors. Participants respond on a scale of 1 (poor) to 9 (excellent) for each item (see Appendix E).

Table 5 summarizes central tendency data for 11 different self-efficacy estimate variables generated by the CLDMA. The first two columns summarize pretreatment and posttreatment total score data. The third column presents total gain score results, and the final eight columns summarize individual item gain score findings. For each self-efficacy estimate score variable, group means, standard deviations, and t-values or F-ratios and their significance have been computed for each level of the treatment, sex, and class/instructor factors.

Several interesting results emerge from the pretreatment total scores on the CLDMA. The theoretical range for this variable is from 8 to 72. The group means for experimental and control participants are nearly identical and represent quite high scores. If participants perceived their decision-making ability as average, their mean score would have been closer to the midpoint of the range, 40, instead of the 51 found. Both groups score more than one standard deviation above the hypothetical mean of 40. Clearly, at the outset of the experiment, students assigned to both treatment conditions considered themselves to be better than average. This finding is consistent with the results of numerous social psychology experiments on the "seeming epidemic of self-serving biases" (Myers & Ridl, 1979). Since the CLDMA specifically asked students to rate their abilities "as compared with the average person your age," the indication is that almost all respondents considered themselves better than average.

Also of interest is the tendency for females in the sample to report higher self-efficacy estimates of CDM ability than their male counterparts prior to the onset of treatment ($p = .079$). Pretreatment CLDMA total scores for the class/instructor groups ranged from a low of 48.88 to a high of 56.88, producing a statistically significant F ratio $(3,60) = 2.890$; $p = .043$. It is particularly interesting to note that the highest pretreatment estimates of decision-making ability were generated by the 16 students from class/instructor Group 4--all recruited from the Orientation to College third-year English class. These data suggest that higher ability students may have higher self-efficacy expectations for performing certain decision-making behaviors.

The second column in Table 5 reports group means on the CLDMA total score for the posttreatment administration. For the treatment factor, the trend of the data is in the hypothesized direction: experimentals reported somewhat higher self-efficacy estimates than did controls. The difference, however, is not statistically significant. For males and females, the posttreatment CLDMA total scores are almost identical. The group means for class/instructor show a pattern similar to the pretreatment data, with Group 4 students once again reporting significantly higher scores ($p = .002$).

The next nine columns in Table 5 report mean gain scores for the pretreatment and posttreatment CLDMA data. The first of these gain scores

Table 5

Means and Standard Deviations for Check List of Decision-Making Ability (CDMA) Scores

FACTOR / Treatment	Pre-Treatment Total Score		Post-Treatment Total Score		GAIN SCORES: Total		Item #1		Item #2		Item #3		Item #4		Item #5		Item #6		Item #7		Item #8	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Experimental N = 29	51.34	9.3	55.24	8.2	3.93	8.5	.62	1.2	.66	1.7	.62	1.6	.41	2.3	.62	1.6	.62	1.6	.31	1.6	.24	2.1
Control N = 32	51.19	9.5	53.81	8.6	2.53	6.1	.59	.8	.25	2.1	.31	1.5	.50	2.4	.34	1.7	.41	1.9	-.09	1.8	.19	1.8
t-values df = (1,60)	0.004		0.439		0.435		0.005		0.680		0.577		0.021		0.436		0.217		0.828		0.012	
p	.948		.510		.512		.947		.413		.450		.887		.512		.643		.366		.915	
Sex																						
Male N = 31	49.19	8.8	54.74	8.7	5.81	7.8	.81	1.4	.97	1.9	.74	1.4	.87	2.4	.48	1.8	.74	2.0	.74	1.8	.52	1.7
Female N = 30	53.40	9.5	54.23	8.1	0.50	7.9	.40	1.7	-.10	1.8	.17	1.7	.03	2.2	.47	1.5	.27	1.5	-.57	1.4	-.10	2.1
t-values df = (1,60)	3.206		0.055		6.958		1.046		5.085		2.066		2.007		0.002		1.082		10.048		1.563	
p	.079		.315		.011		.311		.028		.156		.162		.968		.303		.002		.216	
Class/Instr. Group																						
1 N = 16	49.81	10.3	49.81	8.4	-.31	8.3	.44	1.2	-.25	1.7	-.06	1.9	0.0	2.7	-.44	1.4	.19	1.5	.38	1.7	-.50	1.9
2 N = 13	48.38	10.4	54.69	6.4	6.50	7.9	1.25	1.6	.88	1.7	.38	1.4	.94	2.4	1.3	1.6	.75	2.3	0.0	1.6	1.25	2.2
3 N = 16	49.08	6.1	52.77	8.2	-.70	8.4	-.38	1.6	1.0	1.9	.85	1.6	.92	2.6	.38	1.7	1.23	2.0	-.23	1.4	-.08	2.0
4 N = 16	56.88	7.7	60.38	7.3	3.00	7.6	.94	1.5	.25	2.1	.75	1.3	.06	1.4	.69	1.5	0.0	1.1	.19	2.1	.13	1.3
F-Ratio df = (3,60)	2.890		5.491		1.931		3.339		1.427		1.044		0.750		3.333		1.443		0.314		2.553	
p	.043		.002		.135		.026		.244		.380		.527		.026		.240		.615		.064	
Total Sample N = 61	51.26	8.9	54.49	7.6	3.20	8.2	.61	1.6	.44	1.9	.46	1.6	.46	2.3	.48	1.6	.51	1.8	.10	1.7	.21	1.9

reflects mean total gains over the entire eight-item instrument, with a theoretical range of -64 to 64 for this variable. Both the experimental and control groups reported slight gains in self-efficacy estimates of decision-making ability. The slightly larger gains of the experimentals is nonsignificant (p = .512).

A more interesting and quite unexpected finding is the mean total gain score difference for males and females in the sample. Males outgained females by an average of more than 5 points, a different significant at the .011 level. Both experimental males and females outgained their control counterparts, the males by 7.29 to 4.59, and the females by 0.80 to 0.20. From these data one might posit a significant treatment condition by sex interaction, but as Table 6 reveals, none of the two-way interactions for the analysis of variance (ANOVA) of CLDMA total gain scores is even close to statistical significance. The main effect for sex in this three-way ANOVA is quite significant (p = .003), as one might expect from the t-value reported in Table 5.

Table 6 does report a significant three-way interaction for the ANOVA performed on CLDMA total gain scores: $F(3,60) = 7.936$; p · .001. Figure 3 illustrates this interaction resulting from experimental males outgaining control males in class/instructor Groups 1 and 2. For females, the experimentals in Groups 3 and 4 outgained their control counterparts. Means and standard deviations are reported in Table 7. These data suggest that instructors 1 and 2 were most successful in positively influencing the CDM self-efficacy estimates of their male students, whereas instructors 3 and 4 were most successful with female students. Of course, it may also be that either male or female students from particular classes responded especially well to the treatment, or that the interaction between a particular instructor and a given sex from a particular class or classes accounts for the results.

The class/instructor group gain scores range from a low of .31 to a high of 6.50. Although the simple F-ratio for between-group differences is only 1.931 (Table 5), when the main effect for class/instructor is computed in a three-way analysis of variance (Table 6), the F-ratio becomes 2.812 (p = .050). Thus, we can see that the classes from which students were recruited and the treatment instructors influenced the amount of total gain on the CLDMA, with students from class/instructor 2 outgaining students from other classes in self-efficacy estimates of CDM ability by a substantial amount.

The final eight columns of Table 5 summarize the mean gain scores on each of the CLDMA's eight individual items. Both experimental and control students reported increased self-efficacy estimates on every item except item 7 (putting decisions into action), on which controls showed a slight decrease. More importantly, with the exception of item 4 (generating alternatives), experimental students reported higher gain in self-efficacy estimates of decision-making ability than did controls on all of the individual items. However, just as with the posttreatment total scores and total gain scores, the superior item gain scores are not statistically significant. As revealed by Table 5, the t-values for between-group mean differences are quite low, with corresponding significance levels ranging from only .366 to .947. A p level of .050 or less was the decision rule applied to tests of significance for t-values.

Table 6

Analysis of Variance of Total Gain Score on the Check List of Decision-Making Ability as a Function of Treatment, Sex, and Class/Instructor

Source of Variation	df	Mean Square	F	p
Main Effects	5	169.289	3.805	.006
Treatment	1	43.915	0.987	.326
Sex	1	438.800	9.863	.003
Class/Instructor	3	125.091	2.812	.050
2-Way Interactions	7	23.124	0.520	.815
Treatment x Sex	1	14.467	0.325	.571
Treatment x Class/Instr.	3	17.510	0.394	.758
Sex x Class/Instr.	3	26.161	0.588	.626
3-Way Interaction	3	353.069	7.936	$<.001$
Treatment x Sex x Class/Instr.	3	353.069	7.936	$<.001$
Explained	15	137.835	3.098	.002
Residual	45	44.491		
Total	60	67.827		

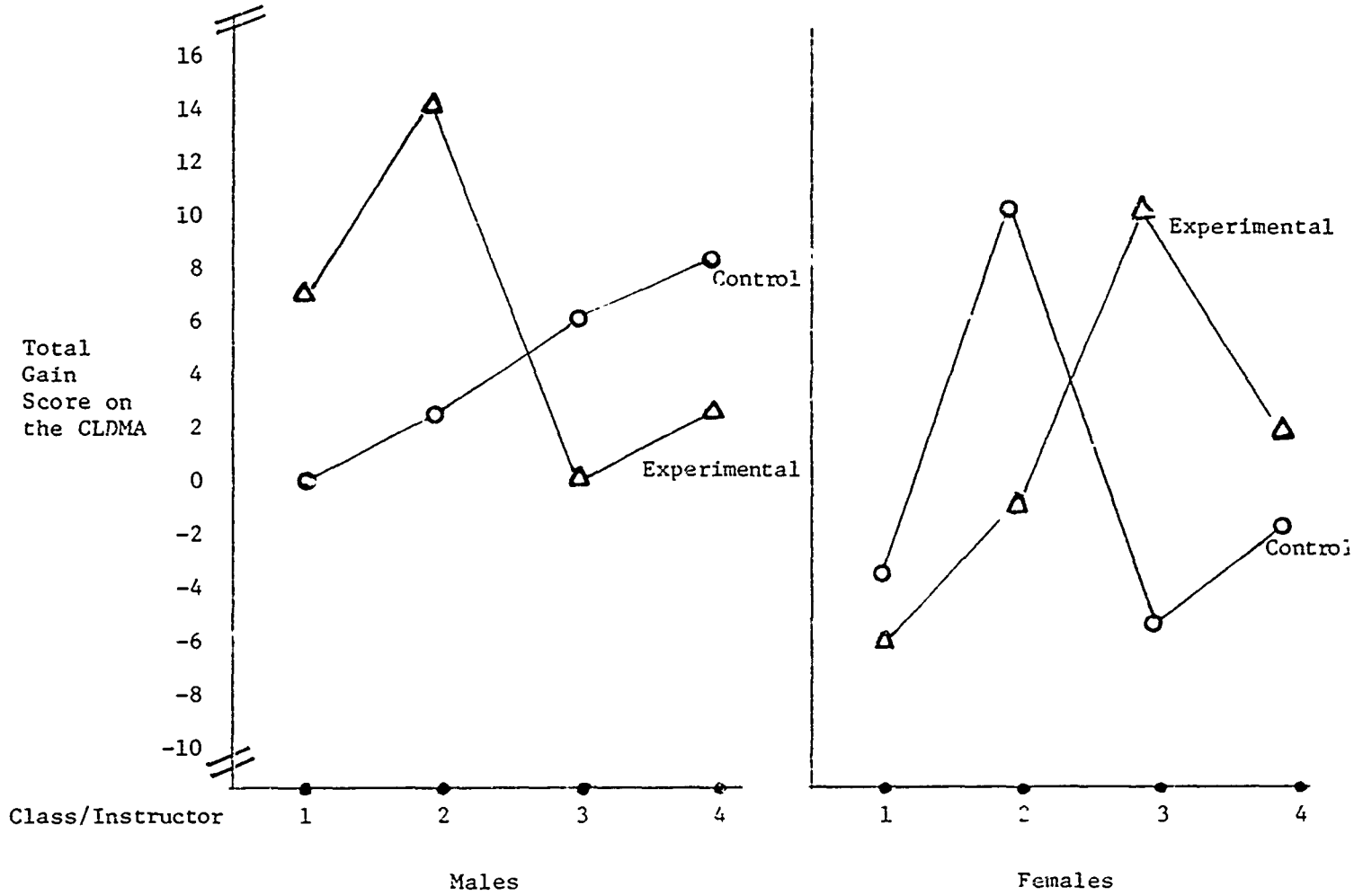

Figure 3. Total gain score on the Check List of Decision-Making Ability as a function of treatment, sex, and class/instructor.

Table 7

Means and Standard Deviations for CLDMA Total Gain Score

Class/Instructor Group		Males		Females		Totals	
		M	SD	M	SD	M	SD
1	Experimental	7.75	7.50	-6.00	6.98	0.88	9.95
	Control	.75	7.27	-3.75	6.02	-1.50	6.63
2	Experimental	14.50	1.00	-1.25	0.96	6.63	8.47
	Control	2.50	4.43	10.25	9.29	6.38	7.91
3	Experimental	0.00	4.24	10.33	2.08	6.20	6.22
	Control	6.40	9.53	-5.00	4.58	2.13	9.63
4	Experimental	3.25	12.37	2.50	4.04	2.88	8.53
	Control	8.25	1.50	-2.00	7.07	3.13	7.24
Total	Experimental	7.29	8.90	0.80	7.03	3.93	8.51
	Control	4.59	6.77	0.20	8.97	2.53	8.06

Male students reported increased self-efficacy expectations on all eight items, while females reported lower self-efficacy expectations on items 2, 7, and 8. Item 2 relates to planning actions for making a decision; item 7 refers to putting decisions into action; and item 8 asks subjects to estimate how well they can recycle through various decision-making activities when present alternatives are unsatisfactory. Males also achieved higher gain scores than females on all eight items, with a statistically significant difference for mean gain scores on item 2 (p = .028) and item 7 (p = .002).

For class/instructor group differences on individual item mean gain scores, only two items (1 and 5) were significant: p = .026 for both (item 1 relates to recognizing the importance of decision situations, while item 5 refers to understanding the outcomes of various alternatives). As Table 5 shows, students from class/instructor groups 2 and 4 reported a net gain on seven items; students from group 3 reported a net gain on five items; and students from group 1 reported a net gain on only three items. For the entire sample, the largest increase was reported for item 1 (recognizing important decision situations), and the smallest increase was reported for item 7 (putting decisions into action). The range here was quite small, however, going from .10 to .61 on a 9-point scale.

The analysis of covariance with pretest scores as the covariate is often preferable to simple gain-score comparisons (see Campbell & Stanley, 1966; Kirk, 1968; Roscoe, 1975). The advantage of covariance analysis over simple analysis of variance depends on the relationship between the pretest and posttest scores. If the variables are correlated at less than

about .30, any added advantage from covariance analysis is likely to be lost. Assumptions underlying the analysis of covariance are essentially the same as those for the analysis of variance, with the added assumption of homogeneity of regression, which requires that the slope of the regression line (predicting y from x) be the same within each of the populations under study (Roscoe, 1975).

With the above considerations in mind, additional analyses were performed on the Check List of Decision-Making Ability (CLDMA) total scores. First, it was noted that the correlation between the CLDMA pretreatment total scores and posttreatment total scores was .585, a significantly high coefficient. Second, the within-groups regression coefficient was estimated and found to be approximately the same for both experimental and control groups. These findings suggested that it would be both appropriate and valid to perform an analysis of covariance on the posttreatment CLDMA total score, using the pretreatment CLDMA total score as the covariate.

Table 8 presents data from a three-way analysis of covariance on posttreatment CLDMA total scores, with pretreatment CLDMA total scores as the covariate, and yielding main effects on treatment condition, sex, and class/instructor. Once again, the main effects due to treatment condition are not statistically significant (p = .362), although the covariance analysis yields a more encouraging significance level than the simple t-test between total gain scores (p = .512) reported in Table 5. The effect of sex of subjects on posttreatment total scores also looks more significant (dropping from p = .815 to p = .099) when pretreatment scores are treated as a covariate. Although class/instructor remains the only significant main effect factor, its contribution is diminished in the three-way analysis of covariance, increasing from p = .002 to p = .015 (see Tables 5 and 8). No significant two-way interaction occurred.

The three-way interaction among the treatment condition, sex of subjects, and class/instructor variables reported in Table 8 is significant: $F(3,60) = 4.548$; p = .007. Figure 4 illustrates this interaction resulting from experimental males who reported higher scores than did controls for class/instructor Group 1 only, while experimental females reported higher scores than their control counterparts in Groups 2 and 3. Means and standard deviations are reported in Table 9. Notice that with the exception of females in class/instructor Group 3, there is little difference between the performance of experimentals and controls within each of the groups. Clearly, posttreatment estimates of CDM ability are most influenced by the class/instructor variable, somewhat less by sex of subjects, and least by treatment condition. Once again it appears that students with superior verbal abilities (primarily those students from class/instructor Group 4) rate their CDM abilities highly, regardless of their sex of participation in a structured training program.

Even though the correlations between pretreatment and posttreatment item scores on the CLDMA are uniformly high (r = .259 to .537; $p \leq .02$), an analysis of covariance was not performed on each of the eight CLDMA item scores, primarily because of the relatively small difference in item scores across all factor levels, and partly because of the uninterpretable nature of such a restricted covariance analysis. Interested readers can review Appendix H for a summary of all CLDMA individual item means, both pretreatment and posttreatment, for all factor levels.

Table 8

Analysis of Covariance of Posttreatment Total Score on the Check List of Decision-Making Ability as a Function of Treatment, Sex, and Class/Instructor with Pretreatment Total Score as a Covariate

Variation	df	Mean Square	F	p
Covariates	1	1437.723	40.210	<.001
Pretreatment Total Score	1	1437.723	40.210	<.001
Main Effects	5	114.242	3.195	.015
Treatment Condition	1	30.402	0.850	.362
Sex	1	101.780	2.847	.099
Class/Instructor	3	139.828	3.911	.015
2-Way Interactions	7	19.599	0.548	.793
Treatment x Sex	1	8.034	0.225	.638
Treatment x Class/Instr.	3	37.332	1.044	.383
Sex x Class/Instr.	3	9.378	0.262	.852
3-Way Interactions	3	162.623	4.548	.007
Treatment x Sex x Class/Instr.	3	162.622	4.548	.007
Explained	16	164.625	4.604	<.001
Residual	44	35.756		
Total	60	70.121		

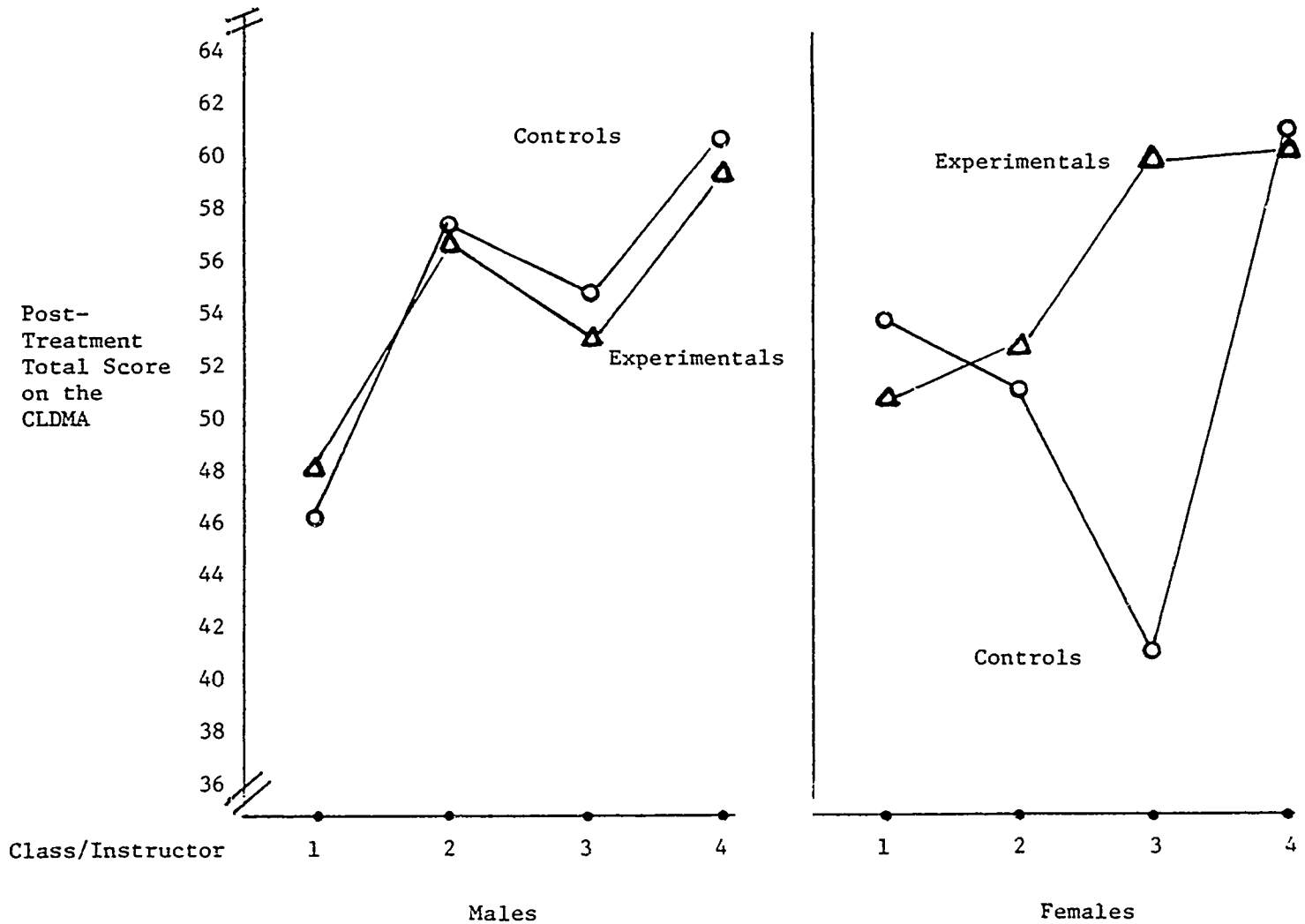

Figure 4. Posttreatment total score on the Check List of Decision-Making Ability as a function of treatment, sex, and class/instructor.

Table 9

Means and Standard Deviations for CLDMA Posttreatment Total Score

Class/Instructor	Group	Males		Females		Totals	
		M	SD	M	SD	M	SD
1	Experimental	48.3	13.4	51.0	3.4	49.6	9.2
	Control	46.5	9.0	53.5	6.4	50.0	8.2
2	Experimental	57.3	5.2	53.0	9.4	55.1	7.4
	Control	57.5	5.0	51.0	4.7	54.3	5.7
3	Experimental	53.0	2.8	60.0	1.7	57.2	4.3
	Control	55.2	6.3	41.3	5.0	50.0	9.0
4	Experimental	58.8	10.0	60.8	5.1	59.8	7.4
	Control	60.5	7.8	61.5	8.6	61.0	7.6
Total	Experimental	54.5	9.6	55.9	6.9	55.2	8.2
	Control	54.9	8.3	52.5	9.1	53.8	8.6

The Effect of Training on Knowledge of Decision-Making Facts and Procedures

The second posttreatment measure administered was the College Board's Career Decision-Making Skills Assessment Exercise (CDMSAE). The CDMSAE is a 60-item multiple-choice test that assesses the student's knowledge of the rational decision-making process in general and the DECIDES model of decisionmaking in particular. A student receives one point for each correct answer, making 60 the maximum possible total score on the instrument. The total score is comprised of seven subscores, each subscore representing one of the seven steps of the DECIDES model.

To determine if the career decision training resulted in experimental students obtaining superior results on the CDMSAE total score and subscores, *t*-tests were performed between the experimental and control groups means on the eight scores. Table 10 shows the means and standard deviations for these scores, along with their *t*-values and corresponding significance levels.

As hypothesized, experimental students outscored control students on the CDMSAE total score and on all seven of the subscores. The total score, and the Identify Alternatives, Discover Probable Outcomes, Eliminate Alternatives Systematically, and Start Action subscore differences were all significant at the .05 level or below. The only difference above the .10 level of significance was the Clarify Values subscore (p = .102), and the other two subscore differences (Define the Problem, p = .083; and Establish an Action Plan, p = .069) were very close to the .05 level of significance.

Table 10

Treatment Group Means and Standard Deviations for Career Decision-Making Skills Assessment Exercise Scores

Treatment Group		Total Score	Subscores: Define the Problem	Establish an Action Plan	Clarify Values	Identify Alternatives	Discover Probable Outcomes	Eliminate Alternatives Systematically	Start Action
Experimental (N = 29)	M	39.7	2.3	8.7	6.1	6.3	9.2	4.3	2.8
	SD	13.3	1.3	2.6	2.5	1.8	4.0	1.9	1.2
Control (N = 32)	M	31.3	1.8	7.4	5.0	5.5	7.0	2.6	2.1
	SD	10.6	1.0	2.5	2.4	1.5	3.2	1.8	0.9
N items		60	4	11	9	9	16	7	4
df = (1,60)	t	7.338	3.111	3.444	2.755	3.853	6.050	12.394	7.504
	p	.009	.083	.069	.102	.054	.017	.001	.008

These data clearly suggest that students who participated in the training knew significantly more about the process of rational career decisionmaking than did control students, as assessed by an objective cognitive measure.

Since the results on the CDMSAE indicated such an overwhelmingly superior performance by experimental students, the data were scrutinized more carefully. Could the results be due to an expectancy bias? Were experimental students simply trying harder because of their participation in the treatment--did they believe that it was important to do well because they had spent 7 weeks learning about career decisionmaking? One way to investigate this question is to examine the total number of items attempted and the percentage of items attempted that were answered correctly by students in each treatment condition.

Table 11 reveals that most students did not finish the test. About twice as many experimentals as controls completed the CDMSAE. Although experimental students did answer about four more questions on average than did control students, the difference in their scores is not explained by this factor because experimentals averaged about 8 points higher on their mean raw scores. Experimentals also were significantly more accurate than were controls in answering whatever items were attempted. The only thing these data reveal is that although more experimentals completed the exercise, the superior scores of experimental subjects are not completely accounted for by a significant mean difference in the number of items attempted.

Another factor that could influence scores on the CDMSAE is the seriousness of participants, or the degree to which they put forth their best effort. In other words, to what extent did participants try to comprehend and find the best answer for each item attempted? This question cannot be answered with certainty because it requires a subjective interpretation of the data, but several clues merit some discussion. First, as already pointed out, experimental students may have been trying harder, as evidenced by their attempt to answer more questions and to do a better job on the questions they did attempt. An even better criterion of effort may be to estimate which scores (of completed CDMSAEs) appear to be random guessing, and then eliminate these scores in computing group means.

If students completed the CDMSAE by merely guessing at the answers, then they should obtain an average score of about 15 because there are four alternative responses for each of the 60 items. Allowing for a standard deviation of 10 points, any score in the 5 to 25 total points range might represent random guessing. A review of the raw data reveals that of the 12 experimentals completing the CDMSAE, 2 participants fell within this range, while 3 of the 7 controls obtained similarly low scores. It should be added that the experimenter's observations of student behavior during the administration of the CDMSAE supports the a priori statistical interpretation of these 5 scores as random guessing. Table 11 indicates that only 2.5% more control participants biased the results negatively by appearing to guess randomly on the instrument. Also, the final entry in Table 11 shows that the adjusted raw score means (after eliminating the 5 guessing scores) do not change the significantly better performance of students who participated in the training. Thus, it seems reasonable to conclude that group differences on the CDMSAE reflect true differences in knowledge and are not an artifact of differing expectancy sets.

Table 11

Treatment Group Totals, Means, and Percentages on Selected CDMSAE Total Score Variables

Variable	Treatment Group: Experimental (N = 29)	Treatment Group: Control (N = 32)	Difference
Mean raw score (60 possible)	39.7	31.3	8.4
Percent correct	66.1	52.2	13.9
Number of items attempted	51.5	47.0	4.5
Percentage of items attempted that were correct	77.1	66.7	10.4
Number participants attempting all items	12	7	5
Percent attempting all items	41.4	21.9	19.5
Mean raw score for participants attempting all items	46.8	33.7	13.1
Number of apparent "guessers" (attempted all items and obtained raw score of 5 to 25)	2	3	1
Percentage of "guessers" attempting all items	16.7	42.9	26.7
Percentage of "guessers" for entire sample	6.9	9.4	2.5
Adjusted mean raw score (minus "guessers")	40.9	32.8	8.1

The next set of calculations performed on the CDMSAE data was based on a three-way analysis of covariance (ANCOVA) yielding main effects on treatment condition, sex, and class/instructor. As mentioned earlier, certain pretreatment academic achievement data were obtained for students participating in this study. Specifically, grade-point averages and scores on the math applications and reading comprehension sections of the Stanford Achievement Test Battery Analysis (also known as the Stanford Task Battery Analysis) were available. All three of these metric variables were highly correlated with the CDMSAE total score and subscores (see Table 12).

Table 12

Pearson Product-Moment Correlations of Potential Covariates with Dependent Variables

Dependent Variables	Covariates		
	Grade Point Average	STBA[d] Math	STBA Reading
CLDMA[a]			
Pretreatment total	.083	.046	.032
Posttreatment total	.070	-.066	.113
Total gain	-.002	-.069	.158
CDMSAE[b]			
Total	.596*	.545*	.622*
Define	.451*	.462*	.462*
Establish	.491*	.421*	.504*
Clarify	.645*	.584*	.609*
Identify	.458*	.331*	.420*
Discover	.533*	.473*	.602*
Eliminate	.439*	.425*	.448*
Start	.387*	.476*	.395*
CDS[c]			
Values Congruence Time 2	.034	.174	.282*
Values Congruence Time 1	.255*	.114	.098
Accuracy	.304*	.431*	.490*
Thoroughness	.225*	.127	.213
Confidence level	.107	-.034	.078
No. cards used	.244*	.497*	.514*
Time spent	.154	.516*	.418*

*$p \leq .05$.

[a]CLDMA = Check List of Decision-Making Ability.

[b]CDMSAE = Career Decision-Making Skills Assessment Exercise.

[c]CDS = Career Decision Simulation.

[d]STBA = Stanford Task Battery Analysis.

Therefore, the grade point average (GPA) and math and reading scores were treated as covariates in an ANCOVA procedure after checking to make certain that the homogeneity of regression assumption was not violated. This covariance analysis is a more refined calculation than simple analysis of variance. Whenever two measures are correlated, one can be used to predict scores on the other. To the extent that performance on any dependent measure such as the CDMSAE can be predicted from performance on pretreatment measures such as GPA or reading scores, this performance cannot be attributed to the experimental treatment. The ANCOVA essentially consists of determining that a proportion of the variance on the criterion variable existed prior to the intervention so that this proportion can be eliminated from the final analysis (Roscoe, 1975).

Table 13 presents an ANCOVA for the CDMSAE total scores using GPA, Stanford Math Achievement, and Stanford Reading Achievement scores as the covariates. It appears that both GPA and reading ability account for a significant amount of the variance in total scores on the CDMSAE. However, even after the covariate variance is accounted for, the effect of treatment is significant at the .011 level--strong support for the superior performance of students participating in the experimental treatment. Since there are no significant two-way or three-way interactions, it would appear that the treatment was not differentially effective with either sex, a particular class/instructor group or groups, or either sex in a particular group in increasing overall knowledge about the facts and procedures of rational career decisionmaking.

Tables 14 to 20 present similar three-way analysis of covariance (ANCOVA) results for the seven subscores of the CDMSAE. These subscores relate to the seven steps of the previously described DECIDES model (Krumboltz & Hamel, 1977): Define the Problem, Establish an Action Plan, Clarify Values, Identify Alternatives, Discover Probable Outcomes, Eliminate Alternatives Systematically, and Start Action.

The ANCOVA calculations performed on the first four subscores did not yield any significant main effects or interactions (see Tables 14 to 17). For the Establish subscore, the class/instructor variable approached significance (p = .077), with differences on this 11-item scale ranging from a low of 6.8 for Group 2 to a high of 9.1 for Group 4. For the Identify subscore, the treatment variable approached significance (p = .098), with experimentals outscoring controls 6.3 to 5.5 on this 9-item scale.

Just as with the total score on the CDMSAE, both the GPA and reading score covariates account for a significant amount of the variance on most of the subscores. For the first four subscores, GPA is correlated significantly in three of the ANCOVA calculations and is close to significance in the fourth one: Define, p = .078; Establish, p = .018; Clarify, p = .001; and Identify, p = .020. The Stanford Task Battery Analysis reading scores correlate significantly with the 11-item Establish (p = .033) and 9-item Clarify (p = .011) scales, and approach significance (p = .099) for the 9-item Identify scale. The actual correlation coefficients appear in Table 12.

The ANCOVAs performed on the last three CDMSAE subscores all yielded a significant main effect for the treatment factor only and no significant

Table 13

Analysis of Covariance of Total Score on the CDMSAE as a Function of Treatment, Sex, and Class/Instructor with GPA, Math, and Reading Scores as Covariates

Source of Variation	df	Mean Square	F	p
Covariates	3	1543.453	19.791	.001
GPA	1	858.171	11.004	.002
Stanford Math	1	124.291	1.594	.214
Stanford Reading	1	634.782	8.140	.007
Main Effects	5	150.346	1.928	.110
Treatment	1	559.525	7.175	.011
Sex	1	0.637	0.008	.928
Class/Instructor	3	68.913	0.884	.458
2-Way Interactions	7	39.070	0.501	.828
Treatment x Sex	1	59.481	0.763	.388
Treatment x Class/Instr.	3	9.740	0.125	.945
Sex x Class/Instr.	3	59.606	0.764	.521
3-Way Interaction	3	155.969	2.000	.129
Treatment x Sex x Class/Instr.	3	155.968	2.000	.129
Explained	18	340.193	4.362	.001
Residual	41	77.986		
Total	59	157.981		

Table 14

Analysis of Covariance of "Define" Subscore on the CDMSAE as a Function of Treatment, Sex, and Class/Instructor with GPA, Math, and Reading Scores as Covariates

Source of Variation	df	Mean Square	F	p
Covariates	3	8.151	6.888	.001
GPA	1	3.871	3.271	.078
Stanford Math	1	1.619	1.368	.249
Stanford Reading	1	2.478	2.094	.155
Main Effects	5	0.749	0.633	.676
Treatment	1	1.774	1.499	.228
Sex	1	0.415	0.350	.557
Class/Instructor	3	0.564	0.477	.700
2-Way Interactions	7	0.750	0.634	.725
Treatment x Sex	1	0.556	0.470	.497
Treatment x Class/Instr.	3	0.471	0.398	.755
Sex x Class/Instr.	3	1.016	0.858	.470
3-Way Interaction	3	0.338	0.285	.836
Treatment x Sex x Class/Instr.	3	0.338	0.285	.836
Explained	18	1.915	1.618	.101
Residual	41	1.183		
Total	59	1.406		

Table 15

Analysis of Covariance of "Establish" Subscore on the CDMSAE as a Function of Treatment, Sex, and Class/Instructor with GPA, Math, and Reading Scores as Covariates

Source of Variation	df	Mean Square	F	p
Covariates	3	44.471	10.526	.001
GPA	1	25.704	6.084	.018
Stanford Math	1	2.116	0.501	.483
Stanford Reading	1	20.639	4.885	.033
Main Effects	5	8.219	1.945	.108
Treatment	1	10.899	2.580	.116
Sex	1	0.098	0.023	.880
Class/Instructor	3	10.365	2.453	.077
2-Way Interactions	7	3.715	0.879	.531
Treatment x Sex	1	7.733	1.830	.184
Treatment x Class/Instr.	3	0.999	0.236	.870
Sex x Class/Instr.	3	4.872	1.153	.339
3-Way Interaction	3	8.664	2.051	.122
Treatment x Sex x Class/Instr.	3	8.664	2.051	.122
Explained	18	12.584	2.978	.002
Residual	41	4.225		
Total	59	6.775		

Table 16

Analysis of Covariance of "Clarify" Subscore on the CDMSAE as a Function of Treatment, Sex, and Class/Instructor with GPA, Math, and Reading Scores as Covariates

Source of Variation	df	Mean Square	F	p
Covariates	3	67.043	25.035	.001
GPA	1	41.755	15.592	.001
Stanford Math	1	8.735	3.262	.078
Stanford Reading	1	19.205	7.172	.011
Main Effects	5	2.973	1.110	.370
Treatment	1	3.274	1.222	.275
Sex	1	0.219	0.082	.776
Class/Instructor	3	4.054	1.514	.225
2-Way Interactions	7	3.744	1.398	.232
Treatment x Sex	1	8.225	3.072	.087
Treatment x Class/Instr.	3	2.154	0.804	.499
Sex x Class/Instr.	3	4.219	1.576	.210
3-Way Interaction	3	0.862	0.322	.810
Treatment x Sex x Class/Instr.	3	0.862	0.322	.810
Explained	18	13.599	5.078	.001
Residual	41	2.678		
Total	59	6.010		

Table 17

Analysis of Covariance of "Identify" Subscore on the CDMSAE as a Function of Treatment, Sex, and Class/Instructor with GPA, Math, and Reading Scores as Covariates

Source of Variation	df	Mean Square	F	p
Covariates	3	14.251	6.916	.001
GPA	1	12.099	5.872	.020
Stanford Math	1	0.075	0.036	.850
Stanford Reading	1	5.864	2.846	.099
Main Effects	5	2.397	1.163	.344
Treatment	1	5.911	2.869	.098
Sex	1	0.175	0.085	.772
Class/Instructor	3	1.636	0.794	.504
2-Way Interactions	7	1.907	0.925	.497
Treatment x Sex	1	3.975	1.929	.172
Treatment x Class/Instr.	3	1.199	0.582	.630
Sex x Class/Instr.	3	1.783	0.865	.467
3-Way Interaction	3	2.586	1.255	.302
Treatment x Sex x Class/Instr.	3	2.586	1.255	.302
Explained	18	4.214	2.045	.029
Residual	41	2.061		
Total	59	2.718		

Table 18

Analysis of Covariance of "Discover" Subscore on the CDMSAE as a Function of Treatment, Sex, and Class/Instructor with GPA, Math, and Reading Scores as Covariates

Source of Variation	df	Mean Square	F	p
Covariates	3	117.795	13.863	.001
GPA	1	54.219	6.381	.015
Stanford Math	1	2.793	0.329	.570
Stanford Reading	1	75.477	8.883	.005
Main Effects	5	13.301	1.565	.191
Treatment	1	47.800	5.626	.022
Sex	1	0.869	0.102	.751
Class/Instructor	3	5.961	0.702	.557
2-Way Interactions	7	1.978	0.233	.975
Treatment x Sex	1	0.071	0.008	.927
Treatment x Class/Instr.	3	0.565	0.067	.977
Sex x Class/Instr.	3	4.026	0.474	.702
3-Way Interaction	3	26.656	1.807	.161
Treatment x Sex x Class/Instr.	3	8.497	1.807	.161
		14.037		
Explained	18		3.137	.001
Residual	41			
Total	59			

Table 19

Analysis of Covariance of "Eliminate" Subscore on the CDMSAE as a Function of Treatment, Sex, and Class/Instructor with GPA, Math, and Reading Scores as Covariates

Source of Variation	df	Mean Square	F	p
Covariates	3	21.121	7.474	< .001
GPA	1	13.223	4.680	.036
Stanford Math	1	3.155	1.117	.297
Stanford Reading	1	5.503	1.947	.170
Main Effects	5	7.830	2.771	.030
Treatment	1	32.303	11.432	.002
Sex	1	0.037	0.013	.910
Class/Instructor	3	2.921	1.034	.388
2-Way Interactions	7	1.178	0.417	.886
Treatment x Sex	1	0.074	0.026	.872
Treatment x Class/Instr.	3	1.535	0.543	.655
Sex x Class/Instr.	3	1.360	0.481	.697
3-Way Interaction	3	6.745	2.387	.083
Treatment x Sex x Class/Instr.	3	6.745	2.387	.083
Explained	18	7.277	2.575	.006
Residual	41	2.826		
Total	59	4.184		

Table 20

Analysis of Covariance of "Start" Subscore on the CDMSAE as a Function of Treatment, Sex, and Class/Instructor with GPA, Math, and Reading Scores as Covariates

Source of Variation	df	Mean Square	F	p
Covariates	3	6.644	6.220	.001
GPA	1	1.734	1.624	.210
Stanford Math	1	3.046	2.852	.099
Stanford Reading	1	1.539	1.440	.237
Main Effects	5	1.109	1.039	.408
Treatment	1	4.765	4.461	.041
Sex	1	0.002	0.002	.965
Class/Instructor	3	0.159	0.149	.930
2-Way Interactions	7	0.459	0.430	.878
Treatment x Sex	1	0.077	0.072	.790
Treatment x Class/Instr.	3	0.245	0.229	.876
Sex x Class/Instr.	3	0.792	0.742	.533
3-Way Interaction	3	1.455	1.362	.268
Treatment x Sex x Class/Instr.	3	1.455	1.362	.268
Explained	18	1.837	1.719	.075
Residual	41	1.068		
Total	59	1.303		

two-way or three-way interactions (see Tables 18 to 20). Experimentals outscored controls on all three scales (see Table 10), and the differences were significant in a three-way ANCOVA at the following significance levels: Discover, $p = .022$; Eliminate, $p = .002$; and Start, $p = .041$. For the 16-item Discover subscore, both GPA ($p = .015$) and reading scores ($p = .005$) were significantly correlated. Only GPA ($p = .036$) was a significant covariate for the 7-item Eliminate subscore, and none of the covariates was significant in the ANCOVA performed on the 4-item Start subscore.

To summarize the three-way ANCOVA findings for the CDMSAE total score and subscores, treatment condition was the only significant main effect factor, and there were no significant two-way or three-way interactions. Treatment condition produced a significant main effect for the total score and three of the subscores, with experimentals outscoring controls in each instance. These analyses yield the following observations: (a) Prior academic performance (GPA) and especially reading ability tend to predict scores on a measure of knowledge about the facts and procedures of career decisionmaking, and (b) even when such student attribute variables are accounted for, high school students participating in a structured decision training program do significantly better than their control counterparts on an extensively normed and validated cognitive measure of knowledge about career decisionmaking.

Simple three-way analysis of variance (ANOVA) calculations yielding main effects on treatment condition, sex of subjects, and class/instructor group were also performed on the CDMSAE data (see Appendix I). The ANOVA F-ratios suggest an even stronger main effect due to treatment, but of course the variance in the error term attributable to the covariates is not taken into account.

The Effect of Training on Performance on a Simulated Career Decision Problem

The final posttreatment measure administered was the Career Decision Simulation (CDS). As described previously, this instrument requires participants to make a simulated career choice among 12 available fictitious occupations. The CDS yields five different scores reflecting the quality of a simulated career decision: (a) accuracy in interpreting the information used to investigate the chosen occupation; (b) a values congruence score based on a comparison of the actual work value characteristics of the chosen occupation with a participant's specified value preferences on a forced choice rating task administered about 4 weeks prior to using the CDS; (c) a similar values congruence score based on value ratings collected immediately after completing the CDS; (d) thoroughness in searching out information about the three personal work values rated as most important immediately after completing the CDS; and (e) self-rated confidence that the occupation chosen represents the best one for the participant among the 12 available. More complete information regarding the functional derivation of these CDS scores is contained in Appendix G, the CDS Administrator's Manual.

To determine if the training program resulted in superior CDS performance scores for its participants, t-tests were performed between the group means for the experimental and control groups. Table 21 reports treatment group means, standard deviations, t-values. and significance levels for the CDS dependent variables. As with the affective (CLDMA) and cognitive (CDMSAE) measures, the results are in the hypothesized direction, with experimentals outscoring controls on all five of the CDS performance criteria.

Table 21

Treatment Group Means and Standard Deviations for Career Decision Simulation Scores

Treatment Group		Accuracy	Values Congruence Time 1	Values Congruence Time 2	Thoroughness of Search	Confidence Level
Experimental	M	62.4	8.2	8.5	48.7	8.1
(N = 29)	SD	11.3	3.0	3.2	15.3	1.2
Control	M	61.0	7.0	7.5	41.5	7.5
(N = 32)	SD	15.5	3.6	2.9	9.4	1.6
df = (1,59)	t	0.169	1.993	1.471	4.864	2.867
	p	.683	.163	.230	.031	.096
Theoretical range		10-85[a]	1-12[b]	1-12[c]	0-100[d]	1-10[e]

[a]85 = 100% accuracy.

[b]12 = best match.

[c]12 = best match.

[d]Percentage of information used relating to high values.

[e]10 = very confident.

However, only the thoroughness of search for information relating to highest values variable is statistically significant ($t(1,59) = 4.864$; $p = .031$). As explained in the methods section and Appendix G, the thoroughness score reflects the percentage of information units used by students relating to the three values specified as most important to them in a work situation. In other words, as Table 21 reveals, about 50% of the information used by experimentals related to their high values as compared to a

little over 40% for controls. There are several possible explanations for this finding. First, experimentals may simply be using a more practical or efficient search strategy by investing more time and effort in investigating their most important personal work values. Such an approach was advocated in the experimental treatment. An equally plausible interpretation of the data involves the concept of values clarification. It may be that experimentals were able to use more information relating to their high values because these students had a clearer sense of their work value priorities. A major goal of the treatment's values clarification exercises was to help students assess what matters most to them in an occupational setting. Perhaps both the search strategy and values clarification explanations account for the significantly better performance of experimentals on this rather practical criterion.

As with the other measures, a 2 x 2 x 4 analysis of variance or covariance was conducted with the CDS scores. Table 12 indicates that only one CDS variable, accuracy, is correlated with any of the covariates at $r = .30$ or higher. Since the CDS accuracy score correlates highly with all three covariates, a three-way ANCOVA was performed yielding main effects on treatment condition, sex of students, and class/instructor group, with GPA, math, and reading scores as covariates. Table 22 presents the ANCOVA for CDS accuracy scores.

The only covariate exerting a significant influence on the CDS accuracy score was the reading score on the Stanford Task Battery Analysis (STBA), $p = .003$. This finding makes sense because the CDS accuracy score is probably measuring both reading comprehension and short-term recall (for those who didn't record observations about the information they read or heard). There are no significant main effects, although sex of participants approaches significance ($p = .091$). Males outscored females 63.0 to 60.3 on the CDS accuracy scale even though females in the sample outscored their male counterparts 59.8 to 58.8 on the reading comprehension section of the STBA.

As Table 22 indicates, the three-way ANCOVA performed on the CDS accuracy score did yield both a significant two-way and three-way interaction. The interaction between the treatment condition and class/instructor group factors, $F(3,58) = 3.289$, $p = .030$, is diagrammed in Figure 5, with means and standard deviations reported in Table 23. This striking two-way interaction occurs because of the large discrepancy between experimental and control performance in class/instructor Group 1, which is against the trend of experimentals outscoring controls in the other three groups. The STBA reading scores in Table 24 may help explain the interaction. Comparing Tables 23 and 24, the high correlation ($r = .490$) between the CDS accuracy scores and STBA reading scores becomes apparent. Within each class/instructor group, the treatment condition group composed of students with the highest reading scores obtained the highest accuracy scores.

The interaction among the treatment, class/instructor, and sex factors produced by the three-way ANCOVA on CDS accuracy scores, $F(3,58) = 4.363$, $p = .009$, is illustrated in Figure 6, with means and standard deviations reported in Table 25. Experimental males outscored control males in class/instructor Groups 3 and 4, while female experimentals achieved higher scores than did their control counterparts in class/instruction Groups 2

Table 22

Analysis of Covariance of "Accuracy" Score on the CDS as a Function of Treatment, Sex, and Class/Instructor with GPA, Math, and Reading Scores as Covariates

Source of Variation	df	Mean Square	F	P
Covariates	3	860.071	9.643	<.001
GPA	1	25.484	0.286	.596
Stanford Math	1	122.794	1.377	.248
Stanford Reading	1	914.918	10.258	.003
Main Effects	5	159.050	1.783	.138
Treatment	1	1.391	0.016	.901
Sex	1	267.627	3.001	.091
Class/Instructor	3	173.132	1.941	.138
2-Way Interactions	7	186.500	2.091	.067
Treatment x Sex	1	77.060	0.864	.358
Treatment x Class/Instructor	3	293.305	3.289	.030
Sex x Class/Instructor	3	92.055	1.032	.389
3-Way Interaction	3	389.156	4.363	.009
Treatment x Sex x Class/Instructor	3	389.157	4.363	.009
Explained	18	324.913	3.643	<.001
Residual	40	89.190		
Total	58	162.345		

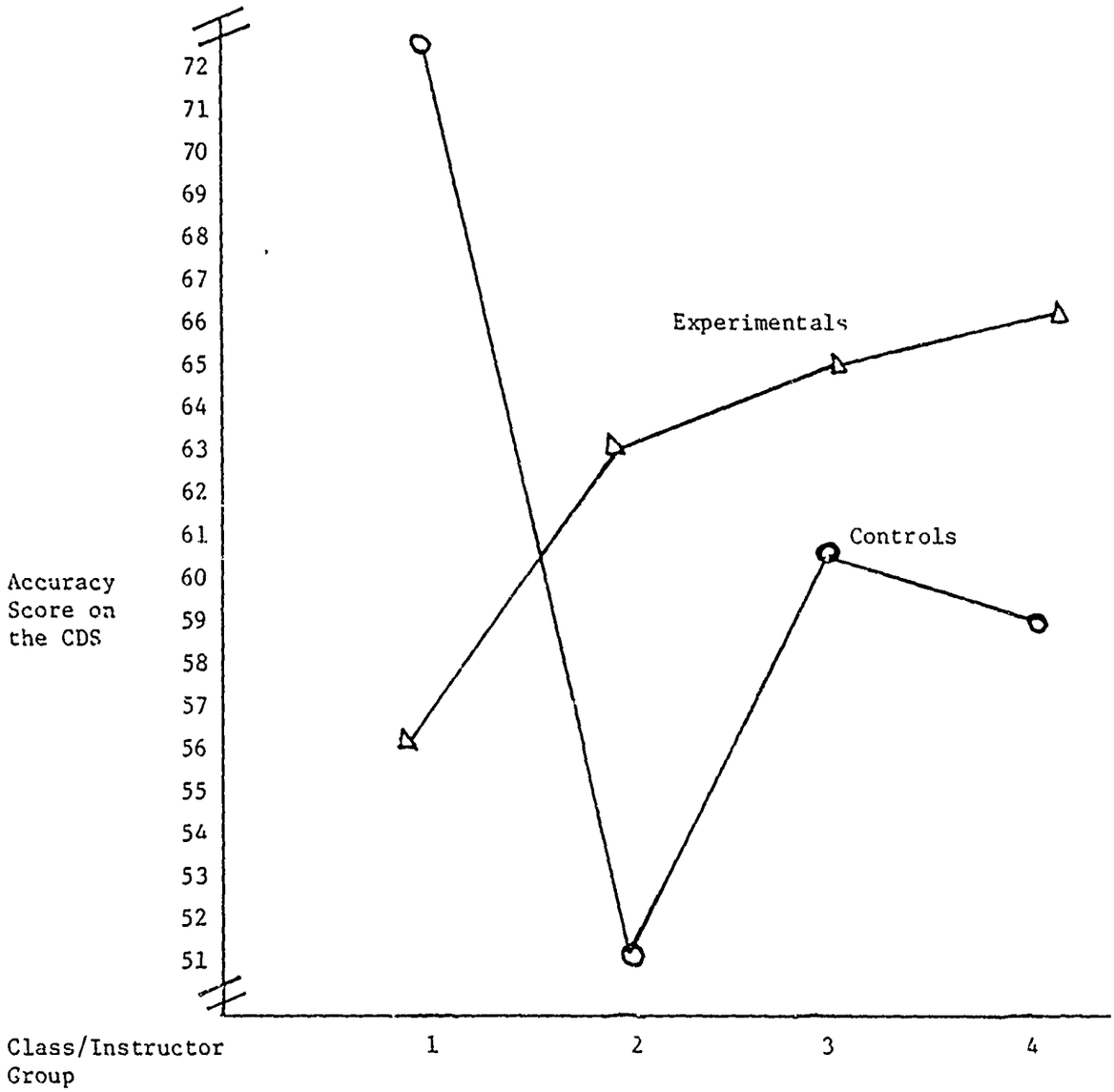

Figure 5. Accuracy score on the Career Decision Simulation as a function of treatment and class/instructor.

Table 23

Means and Standard Deviations
for CDS "Accuracy" Score

Class/Instructor Group	1		2		3		4		Totals	
	M	SD	M	SD	M	SD	M	SD	M	SD
Experimental	56.3	7.9	63.1	13.6	65.0	10.0	66.3	11.9	62.4	11.3
Control	72.5	12.0	51.3	13.0	60.7	18.1	59.4	12.9	61.0	15.5

Table 24

Means and Standard Deviations
for STLA Reading Score

Class/Instructor Group	1		2		3		4		Totals	
	M	SD	M	SD	M	SD	M	SD	M	SD
Experimental	39.9	24.1	61.3	33.3	68.0	9.0	69.0	20.0	58.7	26.1
Control	69.5	15.8	51.3	13.8	51.1	30.7	66.6	14.3	59.9	20.3

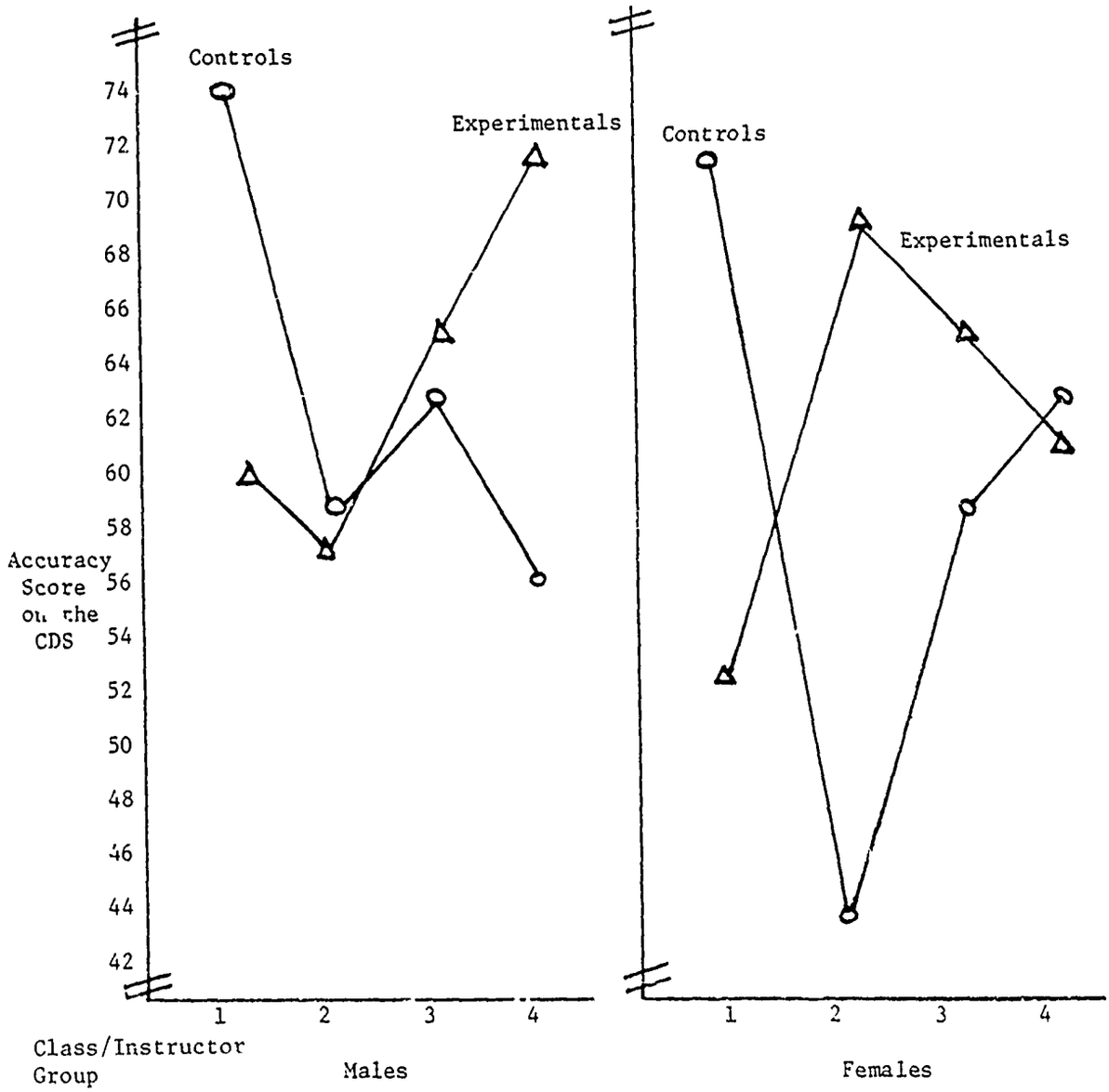

Figure 6. Accuracy score on the Career Decision Simulation as a function of treatment, sex, and class/instructor.

and 3. The largest discrepancies occur in class/instructor Groups 2 and 4. For class/instructor Group 2, male controls outscored experimentals by about 1 point, but female experimentals outscored controls by almost 26 points. The opposite result occurred in Group 4, in which male experimentals outscored controls by 15 points, but female controls averaged about 1 point higher than did experimentals.

Table 25

Means and Standard Deviations (All Factors) for CDS "Accuracy" Score

Class/Instructor Group		Males		Females		Totals	
		M	SD	M	SD	M	SD
1	Experimental	60.0	4.1	52.5	9.6	56.3	7.9
	Control	73.8	13.1	71.3	12.5	72.5	12.0
2	Experimental	57.5	15.0	68.8	11.1	63.1	13.6
	Control	58.8	8.5	43.8	13.1	51.3	13.0
3	Experimental	65.0	14.1	65.0	10.0	65.0	10.0
	Control	62.5	25.0	58.3	5.8	60.7	18.1
4	Experimental	71.3	7.5	61.3	14.4	66.3	11.9
	Control	56.3	18.0	62.5	6.5	59.4	12.9
Total	Experimental	63.2	10.8	61.7	12.1	62.4	11.3
	Control	62.8	16.9	59.0	14.0	61.0	15.5

A simple three-way ANOVA performed on the CDS accuracy score yielded no main effects and a significant interaction between the treatment and class/instructor factors only ($p = .019$). Although the ANOVA calculation produced a slightly higher significance level for the two-way interaction, it failed to identify the highly significant three-way interaction found in the more sensitive ANCOVA calculation.

Since none of the other CDS scores correlated significantly with the covariates (see Table 12), only ANOVA calculations were performed on them. As with the CLDMA variables, the t-test between experimental and control students failed to differentiate the two groups, except for the thoroughness of search variable. Therefore, another series of 2 x 2 x 4 ANOVA calculations was done, using the factors of treatment, sex, and class/instructor group to determine if the treatment had differential effects as a function of the students' sex and class/instructor group membership.

Tables 26 and 27 present the analysis of variance for the CDS values congruence scores. There are no significant main effects or interactions

Table 26

Analysis of Variance of CDS Values Congruence Score (Time 1) as a Function of Treatment, Sex, and Class/Instructor

Source of Variation	df	Mean Square	F	p
Main Effects	5	794.093	0.699	.627
Treatment	1	2297.642	2.022	.162
Sex	1	130.444	0.115	.736
Class/Instructor	3	538.568	0.474	.702
2-Way Interactions	7	1723.826	1.517	.187
Treatment x Sex	1	1987.154	1.749	.193
Treatment x Class/Instructor	3	2067.408	1.819	.158
Sex x Class/Instructor	3	1481.331	1.304	.285
3-Way Interaction	3	305.540	0.269	.847
Treatment x Sex x Class/Instructor	3	305.539	0.269	.847
Explained	15	1130.258	0.995	.477
Residual	44	1136.401		
Total	59	1134.839		

Table 27

Analysis of Variance of CDS Values Congruence Score (Time 2) as a Function of Treatment, Sex, and Class/Instructor

Source of Variation	df	Mean Square	F	p
Main Effects	5	857.074	0.912	.482
Treatment	1	1393.708	1.484	.230
Sex	1	129.006	0.137	.713
Class/Instructor	3	916.591	0.976	.413
2-Way Interactions	7	1167.025	1.242	.301
Treatment x Sex	1	614.989	0.655	.423
Treatment x Class/Instructor	3	379.125	0.404	.751
Sex x Class/Instructor	3	2178.188	2.319	.088
3-Way Interaction	3	1028.340	1.095	.361
Treatment x Sex x Class/Instructor	3	1028.339	1.095	.361
Explained	15	1035.971	1.103	.382
Residual	44	939.358		
Total	59	963.921		

for the values congruence scores based on either the Time 1 or Time 2 personal work values rating task. For the Time 2 (immediately after completing the CDS) score, the interaction between the sex and class/instructor group factors approaches significance, $F(3,59) = 2.319$; $p = .088$ (see Table 27). Nevertheless, treatment is clearly the strongest main effect factor for both values congruence scores. A section of the Summary discusses the possible clinical significance of the superior, but nonsignificant, performance by students participating in the training program.

Table 28 reports the ANOVA performed on the CDS thoroughness of search scores. These data indicate no significant interactions and a significant main effect due to treatment: $F(1,59) = 5.572$, and $p = .023$. The better thoroughness scores achieved by experimentals reflect their use of about 10% more information relating to their highest values, and the ANOVA p value for treatment is even more significant than the t-test ($p = .031$), between treatment group means reported in Table 21. The significantly better thoroughness of search scores achieved by experimentals are probably at least partially responsible for the better values congruence scores also achieved by experimentals.

The final CDS variable, the confidence level score, was analyzed through a three-way ANOVA reported in Table 29. As with the values congruence scores, there were no significant main effects or interactions. The treatment condition factor accounts for more variance than the other factors, with experimentals reporting greater confidence about the quality of their simulated career choice than controls. However, the half-point difference on a 10-point scale is significant at only the .108 level.

Intercorrelations Between Dependent Variables

Table 30 presents the Pearson product-moment correlations between the 19 major dependent variables assessed in this study: 8 CDMSAE scores, 5 CDS scores, 3 CLDMA scores, and 3 academic achievement scores (GPA, STBA math, and STBA reading). The separate CLDMA scale scores are not reported in this correlation matrix because they consist of only one item each. However, Table 31 reports the Pearson r's between the posttreatment CLDMA item scores and the corresponding subscales on the CDMSAE. This second matrix reveals the relationship between estimated ability to successfully perform certain decision-making behavior and knowledge about how to correctly execute those same behaviors.

Table 30 reveals that the CDMSAE total score has a high positive correlation with the subscores, and that the subscores all have strong positive correlations with each other (p .01). These data are not surprising since the College Board (1978) reports a KR-20 coefficient of .92 for the CDMSAE based on trials with 1,440 10th, 11th, and 12th graders in five states. This finding suggests that the content of the instrument, although covering separate decision-making skill areas, is quite homogeneous. It is also of interest to note that the mean CDMSAE total score for the College Board (1978) sample was 35.35, with a standard deviation of 11.90 (compared to 35.30 and 12.58, respectively, for the study reported here), with a standard error of measurement of 3.32.

Table 28

Analysis of Variance of CDS Thoroughness of Search Score as a Function of Treatment, Sex, and Class/Instructor

Source of Variation	df	Mean Square	F	p
Main Effects	5	0.035	1.891	.115
Treatment	1	0.104	5.572	.023
Sex	1	0.019	1.033	.315
Class/Instructor	3	0.016	0.872	.462
2-Way Interactions	7	0.016	0.858	.546
Treatment x Sex	1	0.019	1.030	.316
Treatment x Class/Instructor	3	0.018	0.987	.408
Sex x Class/Instructor	3	0.012	0.649	.588
3-Way Interaction	3	0.023	1.246	.304
Treatment x Sex x Class/Instructor	3	0.023	1.246	.304
Explained	15	0.024	1.280	.254
Residual	44	0.019		
Total	59	0.020		

Table 29

Analysis of Variance of CDS Confidence Score as a Function of Treatment, Sex, and Class Instructor

Source of Variation	df	Mean Square	F	p
Main Effects	5	3.180	1.536	.198
Treatment	1	5.578	2.695	.108
Sex	1	5.164	2.495	.121
Class/Instructor	3	1.642	0.793	.504
2-Way Interactions	7	1.216	0.587	.762
Treatment x Sex	1	0.719	0.347	.559
Treatment x Class/Instructor	3	0.167	0.081	.970
Sex x Class/Instructor	3	2.442	1.180	.328
3-Way Interaction	3	2.496	1.206	.319
Treatment x Sex x Class/Instructor	3	2.496	1.206	.319
Explained	15	2.127	1.027	.447
Residual	44	2.070		
Total	59	2.084		

Table 30

Pearson Product-Moment Correlation Coefficients
Between the 19 Major Dependent Variables

	CDMSAE Total	Define	Establish	Clarify	Identify	Discover	Eliminate	Start	CDS Accuracy	Values Congruence(1)	Values Congruence(2)	Thoroughness	Confidence Level	CLDMA Total (Pre)	Total (Post)	Total Gain	COVARIATES GPA	STBA Math	STBA Reading	N	Mean	Standard Deviation
CDMSAE Total	1.00	.69	.89	.86	.71	.95	.82	.82	.58	.22	.04	.31	.26	.26	.17	-.09	.60	.51	.61	61	35.30	12.58
Define		1.00	.49	.48	.49	.62	.55	.66	.43	.24	.14	.18	.19	-.01	.02	.07	.45	.43	.46	61	2.00	1.18
Establish			1.00	.75	.60	.81	.65	.65	.51	.12	-.09	.32	.24	.30	.17	-.14	.49	.41	.50	61	8.02	2.61
Clarify				1.00	.54	.78	.65	.62	.61	.22	.01	.23	.13	.13	-.01	-.13	.65	.57	.62	61	5.52	2.47
Identify					1.00	.60	.44	.56	.39	.16	-.01	.36	.20	.13	.18	.06	.46	.37	.43	61	5.85	1.64
Discover						1.00	.74	.76	.52	.19	.04	.26	.26	.35	.26	-.09	.53	.44	.59	61	8.05	3.75
Eliminate							1.00	.68	.44	.15	.12	.22	.22	.15	.05	-.11	.44	.38	.42	61	3.43	2.04
Start								1.00	.38	.26	.12	.20	.27	.25	.24	-.02	.39	.44	.42	61	2.43	1.15
CDS Accuracy									1.00	.27	.20	.10	.06	.10	-.08	-.17	.31	.39	.50	60	61.67	13.52
Values Congruence(1)										1.00	.36	.18	.15	-.11	-.08	.06	.25	.16	.16	60	7.56	3.37
Values Congruence(2)											1.00	.21	-.10	-.23	-.30	-.05	.03	.15	.28	60	7.97	3.10
Thoroughness												1.00	.20	-.25	-.19	.08	.22	.13	.21	60	44	.14
Confidence Level													1.00	.24	.29	.07	.11	.03	.14	60	7.82	1.44
CLDMA Total (Pre)														1.00	.58	-.51	.08	.04	.09	61	51.26	9.34
Total (Post)															1.00	.37	.07	-.04	.12	61	54.49	8.37
Total Gain																1.00	.01	-.04	.09	61	3.20	8.24
COVARIATES GPA																	1.00	.46	.50	60	2.81	.52
STBA Math																		1.00	.59	60	60.87	23.48
STBA Reading																			1.00	60	59.30	23.13

$r \geq .22$, $p \leq .05$ $r \geq .42$, $p \leq .01$

Table 31

Pearson Product-Moment Correlation Coefficients Between Posttreatment CLDMA and CDMSAE Subscores

	CDMSAE Total	Define	Establish	Clarify	Identify	Discover	Eliminate	Start	CLDMA Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Mean	Standard Deviation
CDMSAE Total	1.00	.69	.89	.86	.71	.95	.82	.82	.38	-.13	.20	.05	.15	.10	.03	35.30	12.58
Define		1.00	.49	.48	.49	.62	.55	.66	.32	-.24	.04	.06	.09	-.07	-.09	2.00	1.18
Establish			1.00	.75	.60	.81	.65	.65	.41	-.05	.13	-.03	.12	.16	.13	8.02	2.61
Clarify				1.00	.54	.78	.65	.62	.17	-.26	.17	-.07	.11	-.01	-.08	5.52	2.47
Identify					1.00	.60	.44	.57	.40	-.08	.16	.10	.05	.24	-.04	5.85	1.64
Discover						1.00	.74	.76	.37	-.08	.28	.16	.21	.18	.06	8.05	3.75
Eliminate							1.00	.68	.18	-.05	.11	.01	.07	-.09	-.01	3.43	2.04
Start								1.00	.43	.03	.19	.04	.20	.08	.15	2.43	1.15
CLDMA Item 1									1.00	.33	.30	.31	.42	.44	.50	7.26	1.24
Item 2										1.00	.16	.11	.15	.34	.49	6.08	1.71
Item 3											1.00	.38	.24	.28	.45	7.28	1.55
Item 4												1.00	.37	.49	.40	6.46	1.88
Item 5													1.00	.50	.36	6.79	1.66
Item 6														1.00	.56	7.05	1.24
Item 7															1.00	6.84	1.49

$r \geq .22$, $p \leq .05$ $\quad$ $r \geq .42$, $p \leq .01$

The CDMSAE scores, derived from a cognitive measure, are not highly correlated with basic academic achievement scores, especially GPA and STBA reading scores. This fact is not surprising given the amount of reading required by the CDMSAE, and Westbrook's (1980) research, which suggests a large overlap between cognitive measures of career development, such as the Career Maturity Inventory (Crites, 1973a, b) and a concurrent measure of reading ability.

The CDS was designed to be a performance measure--to assess a range of decision-making efficacy factors in a simulated career decision situation. Only one of the five CDS scores, accuracy, is significantly correlated with all three of the covariates and the CDMSAE total score. Again, this result should come as no surprise. The accuracy of interpreting information score is most likely a measure of reading comprehension, so that the high correlation with STBA reading (.50) seems quite reasonable. However, the other four CDS scores appear to be much less related to academic achievement or general aptitude indicators and more a reflection of independent CDM performance skills.

The CDS thoroughness score correlated moderately with both CDMSAE total score (r = .31) and GPA (r = .22). This criterion actually represents an information search strategy, and scores here might be expected to correlate with some kind of scholastic achievement factor. In other words, the most successful participants (as reflected by GPA and CDMSAE scores) were the ones receiving the highest CDS thoroughness scores. Perhaps of even greater interest is the finding that the thoroughness score is not significantly correlated with any of the other CDS performance criteria. The correlation does approach significance with the values congruence scores (r = .18 and .21) and the confidence level score (r = .20), where such a positive relationship might be expected. Nevertheless, these data do support the thoroughness of search criterion as an independent index of CDM competence, but whether the criterion is a useful measure remains to be determined.

A major question addressed in this study concerns the relationship between self-efficacy estimates of CDM ability and measured CDM knowledge and performance. Table 30 reveals that although pretreatment CLDMA total scores are moderately correlated with CDMSAE total scores (r = .26), the posttreatment CLDMA total scores are not. Also, Table 31 reports correlations between the posttreatment CLDMA item scores and the corresponding subscales on the CDMSAE. Only the correlation between the Define subscore and CLDMA item 1 score is significant (r = .32), suggesting that there is little meaningful relationship between estimated ability to perform certain decision-making behaviors and knowledge about how to correctly execute those same behaviors.

The only significant positive correlation between the CLDMA total scores and a CDS variable involved the confidence level score (r = .24 and .29 pretreatment and posttreatment, respectively). This finding makes sense intuitively because both scores can be said to measure self-confidence--the CLDMA based on past performances and the CDS based on an immediate one. In other words, self-efficacy estimates of CDM ability are not good predictors of actual performance in a simulated CDM situation, except regarding

the participant's confidence about the performance. It should also be noted that self-efficacy estimates of CDM ability were not significantly correlated with any of the academic ability factors, and that pretreatment and posttreatment CLDMA total scores were highly correlated (r = .58).

The values congruence scores are only moderately correlated with cognitive variables. The Time 1 score is positively correlated with the CDMSAE total score (r = .22), CDS accuracy score (r = .27), and GPA (r = .25). The Time 2 values congruence score is positively correlated with STBA reading (r = .28) and negatively correlated with pretreatment and posttreatment CLDMA scores (r = -.23 and -.30). These negative correlations suggest that those subjects reporting the highest self-efficacy estimates of CDM ability received the lowest values congruence scores based on their work value preference ratings immediately after completing the CDS.

Of particular interest is the surprisingly low correlation (r = .36) between the Time 1 and Time 2 values congruence scores, suggesting major shifts in value preferences over a relatively short time. The CDS task of actually choosing a fictitious occupation perhaps caused some students to adjust their value preferences in accordance with the characteristics of the chosen occupation. Table 32 reports the correlations between Time 1 and Time 2 value ratings for all nine work values for the entire sample and for each treatment condition. Correlations vary widely for experimentals and controls on certain values such as early entry (in which controls were more consistent) and prestige (in which experimentals were more consistent), but no consistent pattern emerges. As Table 32 reveals, controls were more stable in rating their preferences for the first three values, while experimentals tended to be more stable in rating the last six values.

Table 32

Pearson Product-Moment Correlation Coefficients Between Time 1 and Time 2 Personal Work Value Ratings

Personal Work Values	Time 1 - Time 2 Correlation		
	Entire Sample (N = 60)	Controls Only (N = 31)	Experimentals Only (N = 29)
Early entry	.394	.530	.148
Helping others	.412	.509	.338
Income	.498	.538	.407
Independence	.391	.307	.492
Leadership	.439	.411	.545
Leisure	.579	.503	.567
Prestige	.385	.103	.757
Security	.427	.332	.569
Variety	.178	.105	.284

Overall, experimentals shifted their value preferences over time slightly less than did controls. The possible range of value difference ratings, with nine values given, three of which must be rated high (3), three medium (2), and three low (1), is zero to 12 points. So, for example, a change in rating on one value from high to medium would create a difference of 1 point, while a change from high to low on that value would create a difference of 2 points. Across all nine work values, controls averaged a difference of 4.97 points between their Time 1 and Time 2 ratings, while experimentals averaged a difference of 3.86 points. This difference comes close to approaching the .05 level of statistical significance, $F(2,59) = 3.103$; $p = .083$. Perhaps the experimental treatment's values clarification component simply made these students more aware of their value preferences and therefore less likely to be inconsistent over a short period.

Table 33 presents the means and standard deviations for the actual work value ratings (3 = high, 2 = medium, 1 = low) for all nine values at Times 1 and 2. Several things are striking about these data. First, the rank-order ratings for the entire sample at Time 1 and Time 2 are nearly identical. The only shift occurred at the seventh and eighth ranked values, prestige and leadership, which changed positions. Income, security, and independence consistently rank one, two, and three for both controls and experimentals at both Time 1 and Time 2. Also, prestige, leadership, and early entry tend to be the lowest-ranked three, generally ranking seven, eight, and nine, respectively. These findings shed some interesting light on the dominant value concerns of the sample studied.

In summary, although the correlation between Time 1 and Time 2 CDS values congruence scores is only .36, value preferences tended to be more stable than this correlation might indicate. The most stable value was income (no change in rating for 73.3% of the subjects), and the least stable value rating was for variety (no change in rating for 41.1% of the subjects).

The major correlational findings can be summarized succinctly: (a) self-efficacy estimates of CDM ability are not significantly correlated with either CDM knowledge or performance scores; (b) CDMSAE (knowledge) scores are highly correlated with academic achievement data in a positive direction; (c) CDS performance scores are only moderately correlated with academic achievement data in a positive direction; (d) the generally low correlations among the major dependent variables suggest the independence of these attitudinal, cognitive, and performance measures of CDM; and (e) the separate indexes of CDM performance efficacy reported here for the CDS scores appear to be independent.

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Purpose

This study was designed to investigate the effectiveness of a multicomponent training program in career decisionmaking (CDM) on attitudes about, knowledge of, and ability to perform a specified set of CDM behaviors.

Table 33

Means and Standard Deviations for Time 1 and Time 2
Personal Work Values Ratings

Personal Work Values		Entire Sample				Controls				Experimentals			
		Time 1		Time 2		Time 1		Time 2		Time 1		Time 2	
	N	61		60		32		31		29		29	
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Early Entry		1.41	0.64	1.47	0.65	1.50	0.72	1.52	0.72	1.31	0.54	1.41	0.57
Helping Others		2.05	0.83	2.00	0.80	1.97	0.90	2.13	0.81	2.14	0.74	1.86	0.79
Income		2.67	0.57	2.62	0.56	2.59	0.61	2.52	0.57	2.76	0.51	2.72	0.53
Independence		2.26	0.68	2.17	0.72	2.22	0.66	2.26	0.68	2.31	0.71	2.07	0.75
Leadership		1.52	0.70	1.73	0.84	1.78	0.79	1.81	0.87	1.24	0.44	1.66	0.81
Leisure		1.79	0.78	1.87	0.77	1.50	0.67	1.68	0.70	2.10	0.77	2.07	0.80
Prestige		1.75	0.79	1.62	0.76	1.97	0.78	1.68	0.83	1.52	0.74	1.55	0.69
Security		2.44	0.74	2.48	0.77	2.44	0.76	2.35	0.84	2.45	0.74	2.62	0.68
Variety		2.10	0.72	2.05	0.75	2.03	0.78	2.06	0.77	2.17	0.66	2.03	0.73

A seven-lesson curriculum was administered in four different classes to a random half of a sample of students at Mountain View High School in Mountain View, Calif. Thus, the major independent variable consisted of the presence or absence of a CDM skills training program.

A basic assumption of a social learning theory of CDM (Krumboltz, 1979) is that decision-making skills are products of learning experiences and can be directly modified through the application of learning principles. Although systematic attempts have been made to help people develop CDM skills, little research has been done to evaluate these interventions. The study reported here assessed the effects of providing modeling, positive reinforcement, guided practice, and appropriate resources in teaching a rational model of CDM. The goal was to assess the impact of a comprehensive curriculum and to refine some instruments useful for both differential diagnosis and program evaluation.

Specific Objectives

The specific objectives of the study were as follows:

- Investigate whether a prescriptive, multicomponent CDM training program for high school students would produce these results:
  - Superior performance scores on a simulated CDM problem;
  - Superior knowledge scores on a standardized, cognitive measure of CDM principles and facts; and
  - Greater self-efficacy estimates of decision-making ability.
- Observe how self-efficacy estimates of decision-making ability correlate with CDM knowledge and performance scores.
- Observe how CDM performance, knowledge, and self-efficacy scores correlate with basic academic achievement data for the target population.

Research Hypotheses

Directional hypotheses were derived from the previously stated objectives and are listed below under each of the three major outcome measures.

I. Self-efficacy estimates of decision-making ability

1. Students in the treatment groups will report higher self-efficacy estimates of decision-making ability total scores than will controls on the posttreatment administration of the Check List of Decision-Making Ability (CLDMA).

2. Treatment students will obtain higher self-efficacy estimate total gain scores on the CLDMA than will control students.

II. Knowledge of career decision-making facts and procedures

3. Treatment students will score higher than control students on knowledge of decision-making facts and procedures as measured by total scores on the College Board's Career Decision-Making Skills Assessment Exercise (CDMSAE).

4. Treatment students will score higher than control students on each of the seven subscore skill areas comprising the CDMSAE total score.

III. Performance on a simulated career decision problem

5. Treatment students will obtain higher scores than will control students on the following decision-making performance criteria assessed by the Career Decision Simulation (CDS): (a) values congruence, (b) thoroughness of searching relevant information, (c) accuracy in interpreting information, and (d) self-rated confidence in the goodness of the decision.

All of the above hypotheses were rephrased in the null form for purposes of statistical analysis. A p value of .05 or less was the decision rule applied to tests of statistical significance. Main effects and interactions of the major independent variables (treatment condition, sex of subjects, and class/instructor group) were analyzed for their contribution to scores on the criterion measures. Complete correlational analyses were performed to discern any meaningful relationships among the dependent variables.

Method

Subjects were obtained from four third-year English classes (although a few sophomores and seniors also participated) by visiting their classrooms, explaining the training program, and asking for voluntary participation. After stratifying by sex, approximately equal numbers of males and females were randomly assigned to four experimental and four control groups consisting of eight students each.

A randomized "posttest-only control group design" (Campbell & Stanley, 1966) was used with several modifications: (a) a stratified rather than a simple randomization procedure was used; (b) one set of dependent variables, self-efficacy estimates of decision-making abilities, was assessed both pretreatment and posttreatment; and (c) pretreatment academic achievement data were used as covariates in computing the main effects and interactions of the design factors on several dependent variables. The 2 x 2 x 4 design used in this study reflects two levels each for the treatment condition and sex of students and four levels for a combined class of origin and instructor factor abbreviated to class/instructor.

Half of the students were assigned to four no-treatment control groups and did not receive any kind of CDM training. Experimental students in four separate classes participated in a decision skills training program consisting of seven weekly meetings of about 1 hour each, plus homework

assignments. The experimental curriculum was based on the DECIDES model (Krumboltz & Hamel, 1977), which provides guidelines for approaching decision situations in a sequential series of steps that enable a decider to reduce the levels of complexity and ambiguity in an orderly fashion.

The general format for the CDM skills training included a combination of (a) didactic explanations of the concepts being taught, (b) demonstrations of how the skills can be applied to real life situations, (c) guided practice on simulated problems, and (d) opportunities to perform the skills independently. Emphasis was placed on identifying important decisions of current relevance for practicing decision skills training. Instructors employed techniques of modeling and positive reinforcement and provided students with data about important informational resources. Some of the major topics covered in the training included the following: clarifying values and conducting self-assessment, identifying and using worthwhile informational resources, using objective data and subjective impressions to evaluate possible options, changing inaccurate self-attributions and occupational stereotypes, and restructuring the personal environment to increase the likelihood of engaging in desired decision-making behaviors.

Three criterion measures were used to assess the effectiveness of the CDM skills treatment. The Check List of Decision-Making Ability, administered before and after training, measures self-rated efficacy estimates of a participant's ability to perform certain decision behaviors and provides data from the affective domain. The Career Decision-Making Skills, Assessment Exercise, a cognitive instrument, measures knowledge of facts and procedures relevant to CDM. Performance domain data were generated by the Career Decision Simulation, an individually administered instrument that assesses how well a person performs a simulated decision task.

Specific Findings

The results of this study provided some evidence that a structured training program in career decisionmaking based on social learning principles is effective in producing superior scores on measures of career decision-making competence. The findings are summarized below under the headings of the three major outcome measures and five directional hypotheses listed previously.

I. Self-efficacy estimates of decision-making ability

1. Students in the treatment groups reported higher self-efficacy estimates of decision-making ability total scores than did controls on the posttreatment administration of the Check List of Decision-Making Ability (CLDMA). The mean scores were 55.24 for experimentals and 53.71 for controls, yielding a p value of only .510.

2. Treatment students obtained higher mean self-efficacy estimate total gain scores on the CLDMA than did control students (3.93 to 2.53, yielding a p value of only .512).

II. Knowledge of career decision-making facts and procedures

3. Treatment students scored significantly higher than control students on knowledge of decision-making facts and procedures as measured by total scores on the Career Decision-Making Skills Assessment Exercise (CDMSAE). The mean scores were 39.7 for experimentals and 31.3 for controls, yielding a p value of .009.

4. Treatment students scored higher than control students on each of the seven subscore skill areas comprising the CDMSAE total score. The p values ranged from .001 to .102, with the Identify, Discover, Eliminate, and Start subscores at or below the .05 alpha level.

III. Performance on a simulated career decision problem

5. Treatment students obtained higher scores than control students on all five of the decision-making performance criteria assessed by the Career Decision Simulation (CDS). However, performance differences on only one of the CDS variables, thoroughness of search on high values, yielded a significant p value. On this criterion, experimentals outscored controls 48.7 to 41.5; $p = .031$.

IV. Correlations among dependent variables

The major correlational findings were as follows: (a) self-efficacy estimates of CDM ability are not significantly correlated with either CDM knowledge or performance scores; (b) CDMSAE (knowledge) scores are highly correlated with academic achievement data in a positive direction; (c) CDS performance scores are only moderately correlated with academic achievement data in a positive direction; (d) the generally low correlations among the major dependent variables suggest the independence of these attitudinal, cognitive, and performance measures of CDM; and (e) the separate indexes of CDM performance efficacy reported here for the CDS scores appear to be independent.

Conclusions and Implications for the U.S. Army

The results of this study suggest moderate support for the effectiveness of the experimental CDM training program with a population of secondary school students. Specific observations, generalizations, and inferences are noted below, but they cannot necessarily be generalized by a population of U.S. Army personnel without further study.

1. The most striking findings from the CLDMA self-efficacy data relate to the sex of participants and class/instructor group factors. Although experimental and control participants reported nearly identical total score means on the pretreatment administration, experimentals scored about 2 points higher on the posttreatment administration--a nonsignificant difference. However, males in the sample outgained their female counterparts

by over 5 points--a significant difference. It is also the case that males averaged about 4 points lower than females averaged (almost a significant difference) on pretreatment total CLDMA scores. Since both experimental and control males reported sizeable score increases, one cannot say that it was the experimental treatment alone that was differentially effective in significantly increasing the CDM self-efficacy estimates of males in the sample. The greater gains in self-efficacy estimates for males is a surprising finding not predicted or discussed in any of the literature on sex-linked differences in affective or attitudinal development.

2. The class/instructor group differences on CLDMA scores may be easier to explain. One class/instructor group (Group 4) reported significantly higher scores than did the other three groups in the pretreatment administration of the CLDMA. Posttreatment CDM self-efficacy estimates were also significantly higher for this group, but the mean gain was about average for the entire sample. Students comprising class/instructor Group 4 were all drawn from the same advanced third-year English class (Orientation to College). This tracked class was made up of juniors and a few sophomores with superior performance records in English and related subjects. The CLDMA data gathered in this study suggest that students with superior academic abilities (or perhaps those placed in advanced classes) have significantly higher self-efficacy estimates of their ability to perform a range of CDM behaviors.

3. In general, results from the CLDMA were somewhat disappointing. First, the treatment was not effective in producing significantly higher self-efficacy estimates of decision-making ability in experimental group students. One could argue that although practice in learning a practical problem-solving approach for handling decisions might increase self-confidence, full awareness of the complexities of decisionmaking might offset this gain. However, other factors probably better explain the findings. Experimenters noted how very hastily and almost cavalierly students (especially controls on the posttreatment administration) responded to the eight-item CLDMA. Furthermore, there is some reason to doubt how carefully or sincerely students were responding because neither the cognitive nor the performance score data substantiated their relatively high estimates of their decision-making competence. On the other hand, such seemingly inflated beliefs about decision-making prowess may hold up across other samples and populations and be an artifact of the culture, the format of the instrument, or both.

4. Results from the College Board's CDMSAE knowledge test were by far the most impressive outcome data in this study. Students participating in the CDM training program outscored control students on the total score and on all seven subscores. Differences were statistically significant for the total score and for four subscores. However, some caution must be exercised in interpreting this finding. The curriculum units for the decision skills training program were patterned after the DECIDES model, the same model used to develop and group individual items into the seven skill areas for the CDMSAE subscores. One could argue that the experimental training taught to the CDMSAE criterion measure. However, the instructors were not informed about the content of the test items, nor was the curriculum specifically constructed to cover the test items. The effects of the intervention were powerful, even when taking into account

differences in completion rates and random guessing on the instrument. It appears that high school students participating in a structured CDM skills training program do significantly better in recognizing the facts and principles of rational decisionmaking than do their nonparticipating peers. Whether this superior knowledge translates into superior performance is a more complicated question to answer. Army personnel might find the curriculum equally effective, particularly if military examples were substituted.

5. The most difficult data to interpret are the performance score results from the Career Decision Simulation (CDS). Clearly, although experimentals were slightly more accurate in interpreting the information used relating to their job choices, students in both treatment conditions did extremely well on this variable. Their relatively high accuracy scores probably reflect the somewhat simplistic, unambiguous nature of most of the information units. If the information had been more complex, ambiguous, or difficult to interpret (as is often the case in real life), perhaps the more systematic search efforts presumably employed by experimentals would have resulted in significantly higher scores. However, since CDS accuracy scores correlate so highly with reading scores for this sample, it may be that the findings are tapping into a general abilities factor that is not affected by the treatment.

6. It is apparent that experimentals were more likely than were controls to see the importance of concentrating their search on highest rated work values. Again, this was a concept emphasized in the treatment. The significantly higher scores of experimentals could be interpreted as an artifact of the training program but may also represent a superior search strategy. This remains an empirical question since the thoroughness of search variable is more of a process than an outcome criterion. Researchers could speculate that the experimentals' higher CDS confidence level (in choosing the best occupation) scores might be due to the greater effort invested in examining occupational information relevant to their most prized values in a work setting.

The experimental curriculum was successful in teaching high school students to seek out primarily only that information pertinent to their highest values. Army personnel are assigned specific missions that influence the values to be achieved, so a similar curriculum might well be devised to help soldiers search for the most crucial information in making military decisions.

7. The values congruence scores are the CDS variables most central to conceptualizing the goodness or efficacy of a student's performance on a simulated career decision problem. These scores really represent the extent to which individuals are able to choose an alternative that is consistent with their previously specified value level preferences for an occupation.

Although neither of the rank-order differences for the Time 1 or the Time 2 values congruence scores are statistically significant, the effect size is noteworthy and may have some clinical significance. Experimentals outscored controls by a difference of 1.2 rank-order units (a chance score

was 6.5, and the maximum score was 12) on the Time 1 score and by 1.0 units on the Time 2 score. Given the amount of discontent and dissatisfaction that have been reported in the military services, the ability to choose a job that is even slightly better suited for an individual in terms of its characteristics and rewards may be an important outcome. The Time 1 difference, which is larger, may be even more significant because the values there were stated long before the decision was made.

8. Correlations among the 16 major dependent variables and 3 covariates assessed in this study produced some interesting patterns of association. Self-efficacy estimates of CDM ability did not correlate highly with either CDM knowledge or performance scores. CDM knowledge was somewhat positively correlated with CDM ability as assessed by the CDS, especially on the accuracy, thoroughness of search on high values, and confidence level variables. With the exception of the CDS accuracy score, the only outcome variables significantly correlated with academic achievement factors were the CDMSAE knowledge variables. Overall, the generally low correlations support a multimeasures approach to assessing career decision training outcomes in several domains.

9. The trend of the data is striking. Experimentals outscored controls on all 16 major outcome variables. Differences were statistically significant on six, or about 40%, of these variables. Of course, the possible error introduced by multiple comparisons using so many t-tests must be acknowledged--with 20 dependent variables, the probability is that by chance alone at least one experimental versus control difference will be significant at the .05 level. A more intensive training program or a larger sample size might produce even more significant differences. Other potential independent variables such as time lag between training sessions, particular content areas covered, and instructional techniques used could be just as crucial in shaping the results. Given the nature and size of the sample reported in this study, these findings cannot be conclusive but do suggest some useful approaches deserving attention.

Limitations and Suggestions for Future Research

The research reported here represents an extensive pilot study for the kinds of investigations needed to improve training and assessment efforts in the career decision-making area. Limitations in the present study and suggestions for related research are noted below.

1. This study should be replicated. Inclusion of multiple replication sites would improve the design.

2. The instructor variable was confounded with the separate sampling pools (intact classes) in this study. Future experiments might systematically control for the age, sex, and previous counseling or teaching experience of instructors.

3. There is no evidence to suggest what size of group is optimal for conducting CDM skills training. Future studies might experiment with smaller or larger group sizes than the eight subjects per group used in

the present study. The obvious advantage in working with smaller numbers is the greater opportunity for individual attention and all the positive reinforcement and participant modeling this would allow. However, school administrators might see smaller groups as less cost-effective from a personnel point of view. Comparative outcome studies can best settle this issue.

4. Evidence is also lacking regarding the most efficient number, length, and pacing of sessions. This study employed seven consecutive weekly sessions of about 1 hour each. Would fewer or shorter sessions have worked as well? What about one session per day for an entire week or one 7-hour session? The present study suggested the benefits of a protracted format that allows for practicing the CDM skills in the real world between training sessions. A previous study (Krumboltz et al., 1979) indicated that a single 90-minute training session was unable to demonstrate significant improvements in CDM competence.

5. The present study employed a multicomponent intervention that included the use of positive reinforcement, modeling, the provision of appropriate informational resources, and a number of structured exercises and activities. There is no way of knowing to what extent each of the separate components contributed to the outcomes. Subsequent research could employ several different levels of an experimental treatment to assess the relative effectiveness of separate components.

6. The Check List of Decision-Making Ability (CLDMA) is a weak instrument. In its present form it is probably not a good measure of what Bandura (1977) refers to as self-efficacy. It should be revised to embrace the dimensions of duration and intensity of effort that are part of the self-efficacy research literature. Also, the CLDMA should be lengthened by a factor of two or three from its present eight items to increase its reliability. More extensive field-testing will be required to establish normative data for the instrument. A search for similar experimental measures should be conducted for the purpose of assessing its concurrent validity.

7. Although the Career Decision Simulation (CDS) has already evolved through several major revisions, further modifications are needed. Face validity could be improved by (a) increasing the variety of information sources and number of information units; (b) allowing participants to interact with the simulation for a longer period of time, perhaps during several time-delayed sessions; and (c) making the content of the information units richer and more realistic--more complicated, more ambiguous, and occasionally contradictory.

Also, in its present form the CDS does not introduce or in any way provide for the advent of chance occurrences. Unpredictable events and unforeseen changes in circumstance play a major role in the career decisionmaking of most individuals. The ability to cope with such change and chance is an important CDM skill. Future research with any CDS-like simulations should seek a way to systematically incorporate a chance occurrence factor into the instrument.

8. The CDS yields a cumulative, sequential record of all information used to make a simulated career choice. Thus, the CDS not only provides researchers with outcome scores, but it also provides data from which inferences can be made about a participant's decision-making procedure or style. It is possible to gather information about both decision-making processes and outcomes and see how these data correlate for individuals with varying decision-making predispositions and exposed to different instructional treatments. Unfortunately, this rich store of process data has yet to be investigated thoroughly.

9. In its present form, the CDS is prohibitively expensive to reproduce and difficult to transport. It would probably be relatively easy to write a computer program that would enable participants to interact with the CDS at a CRT terminal. The development of such a software package would greatly increase the CDS's use as a research tool and program evaluation instrument, and possibly as an instructional aid.

10. The CDS has great potential as an induction aid or teaching device in a career skills training program. Students are unanimous in reporting their enjoyment in using the CDS. It has strong motivational value, features a learn-by-doing format, has a life-like and nonacademic quality, and provides a compact, controlled learning environment. As part of an introduction to a bounded rationality approach to making career decisions, the CDS would be appropriate for a variety of populations.

11. Although the training program used in this study covered aspects of false occupational stereotypes and inaccurate self-attributions related to occupational aspirations, future studies should deal more explicitly with the emotional aspects of career decisionmaking. Belief systems should be delineated, explored, and perhaps challenged or modified. Both the interventions and the criterion measures should be sensitive to emotional influences on CDM competence.

12. Investigators need better measures to assess career development outcomes, particularly in the decision-making area and in the performance domain. Sound behavioral measures are particularly scarce. In assessing CDM competence, researchers need to improve the technology available for both program evaluation and the differential diagnosis of individual skill deficits.

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APPENDIX A

STATEMENT OF CONSENT[a]

I, (please print your name) _____ certify that I understand that I will be participating in a research project designed to evaluate the effectiveness of a career decision-making training program. I understand that if I am assigned to one of the training groups I will be expected to attend a class one period each week for 8 weeks, and asked to complete brief assignments requiring about 1 hour of work outside of class each week. Regardless of which group I am assigned to, I understand that I will be asked to spend an additional 2 hours completing several exercises that measure my attitudes, knowledge, and skills in the area of career decision-making.

I further understand that I am free to withdraw my participation in the study at any time. I understand that any information collected is strictly confidential, and will be viewed with my name present only by those directly affiliated with the project. Also, I am aware that if I am dissatisfied with any aspect of the project at any time, I may report grievances anonymously to the Sponsored Projects Office at Stanford University at phone number (415) 497-2883.

Signed: _____
(Research Project Participant)

Address: _____

Phone No. _____

Date: _____

Note: Check this box if you do <u>not</u> wish to participate. ☐

[a]Consent forms distributed to students in English classes at Mt. View High School in January of 1979.

APPENDIX B

PROPOSITIONS IIA1, IIA2, and IIA3 FROM KRUMBOLTZ'S SOCIAL LEARNING THEORY OF CAREER DECISIONMAKING

The following propositions and illustrative hypotheses are concerned with factors which influence CDM skills, and are excerpted from Krumboltz's (1979) social learning theory of career decision making.

"CDM skills are a subset of task approach skills pertinent to occupational and educational decision making. Propositions in this section attempt to explain how these particuoar skills are acquired.

Proposition IIA1: An individual is more likely to learn the cognitive and performance skills and emotional responses necessary for career planning, self-observing, goal setting, and information seeking if that individual has been positively reinforced for those responses.

Illustrative Hypothesis: High school students who are given a structured course in decision-making skills and whose efforts in that course are consistently rewarded and never punished will be more likely to apply those decision-making skills in future decision problems than will those high school students not receiving such a course.

Educational institutions may well be able to influence the degree to which people learn how to take control of their own career decisions. CDM is not exclusively the result of events happening to an individual but can also be shaped by an individual's own actions. But people need to know what kind of actions are likely to have some

positive results for them. Systematic instruction can be designed to increase the probability that people can formulate and select intelligently from options that are presented to them or that they may have designed for themselves.

Proposition IIA2: An individual is more likely to learn the cognitive and performance skills and emotioanl responses necessary for career planning, self-observing, goal setting, and information seeking if that individual has observed real or vicarious models engaged in effective decision-making strategies.

Illustrative Hypothesis: Students who observe a CDM film in which the models are depicted as being positively reinforced for engaging in the process will be more likely to engage in a similar process than will students not exposed to the same film.

Films, books, television programs, as well as the opportunity to observe real people wisely engaging in decision-making activities can probably have a great deal of influence on the extent to which young people will learn decision-making skills themselves. Experiments can be designed to determine the exact nature of such experiences that will make them most effective for youngsters of various backgrounds contemplating decisions of various types.

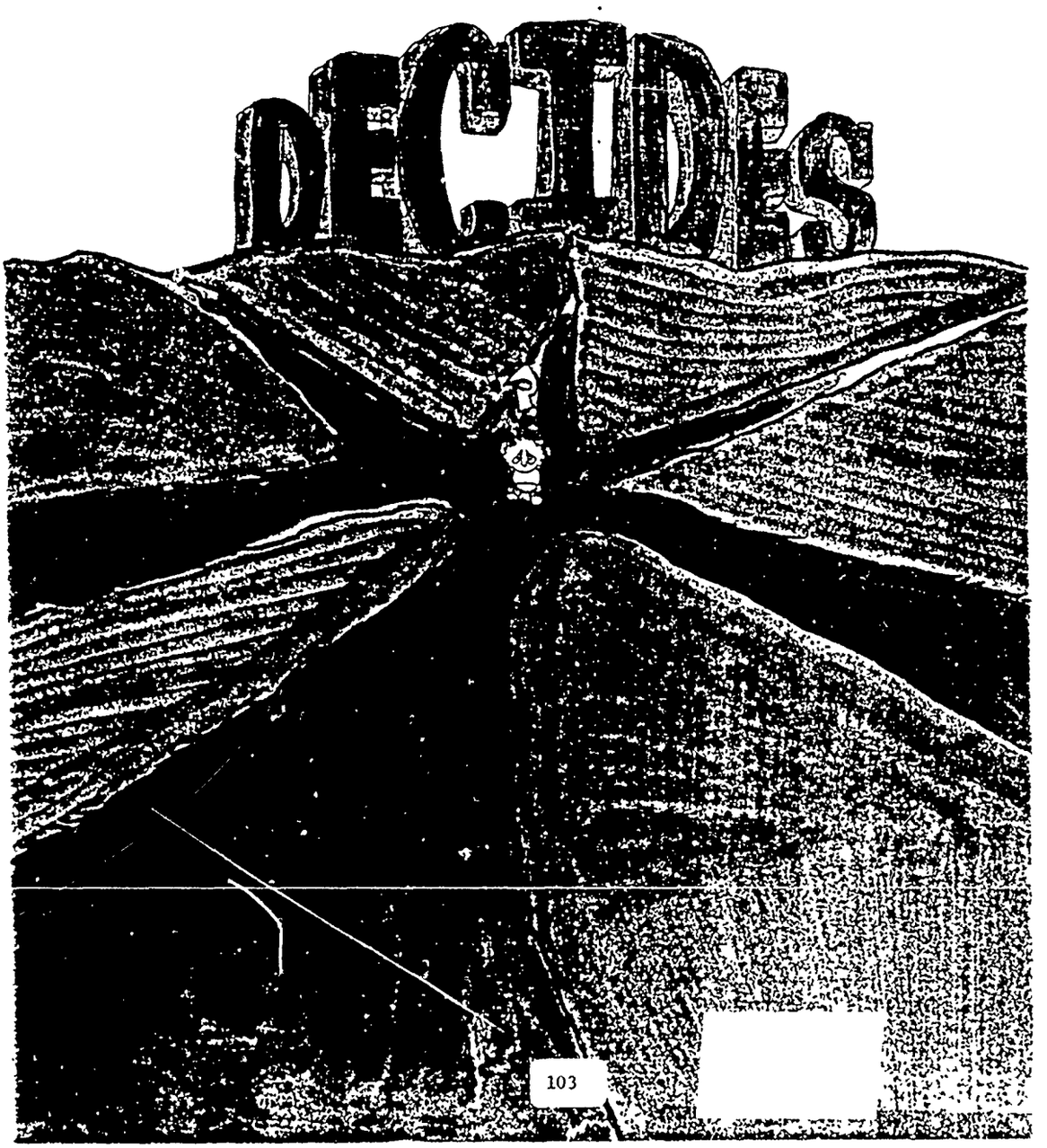
Proposition IIA3: An individual is more likely to learn the cognitive and performance skills and emotional responses necessary for career planning, self-observing, goal setting, and information seeking if that individual has access to people and other resources with the necessary information.

Illustrative Hypothesis: Students in schools that set up procedures for making career information easily accessible in meaningful ways will develop CDM skills to a greater extent than will students in schools not providing such opportunities.

Educational environments which provide needed CDM resources will probably produce superior decision-making skills. However, the resources need to be tailored to the entering skill level of the students and need to be made interesting and pertinent to the target population. Resources include not merely descriptive materials about occupations, but simulated job experiences, opportunities to talk with people engaged in various occupations, and even opportunities to work for short periods of time in close association with people in various occupations."

APPENDIX C

STUDENT'S WORKBOOK: A SEVEN-LESSON CAREER DECISION TRAINING PROGRAM



STUDENT'S WORKBOOK

DECIDES: A Seven-lesson Career Decision Training Program

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School of Education
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[1]The author acknowledges the contributions of Cathy Dougher, Richard Kinnier, John Krumboltz, Stephanie Rude, Dale Scherba, and Elizabeth Snowden in developing materials for this curriculum. Graphics and line drawings were done by Elizabeth Zack.

Lesson #1

INTRODUCTION

You are beginning a program that is designed to help you make better decisions. All of us are faced with many decisions each day. For instance, you probably had to make some choices about what to wear today, what to eat for breakfast, how to get to school, and whether or not to attend this class. These decisions were probably fairly easy for you to make. In fact, because such choices are so common and routine, you may not think of them as decisions at all. However, decision making occurs whenever a person selects from two or more possible alternatives.

As you think about decisions you have made, you become aware that some were much easier to make than others. For example, deciding what to have for lunch yesterday was probably less difficult than deciding which classes to take this semester. Can you think of other decisions you've been faced with recently that were hard to make?

Important decisions usually present us with the biggest problems. Choices that involve our relationships with family members and other important people, our education and training, where we live, and how we spend significant amounts of our time and money are hard to make. We realize that decisions like these often have important long-range consequences. Sometimes just thinking about important decisions makes people so anxious that they either want to avoid them altogether or make them very quickly.

The purpose of this course is to teach you how to make important decisions with greater confidence. You'll be learning a systematic procedure for making complicated decisions easier to manage. You will be given a number of opportunities to practice a series of simple steps on decisions that are presently important to you. We'll be paying special attention to the concerns people have when making decisions about their careers. In other words, how do people make choices about courses to take, parttime and summer jobs, which colleges or training programs to apply to, and what kinds of work they hope to be doing?

Career decision making is important, and it can be frustrating if you don't know how to do it. During the next few weeks you'll learn about some actions you can take to solve your decision problems. Often just describing the decision you want to make and giving yourself a time limit can be very helpful. Too often people try to make decisions without being aware of what is important to them. We'll spend some time finding different ways of getting in touch with what we most value or want to obtain when decisions have to be made.

We'll also look at ways to become aware of our options in a decision situation, and how to use information to discover what might happen if we choose a particular alternative. We'll also examine a procedure for eliminating our options until arriving at the most promising one, and then putting that choice into action. Now, if all this talk about alternatives, values, and using information seems confusing, don't be concerned. All of these topics will be discussed many times during our weekly meetings, and you'll have plenty of practice in trying them out.

One final point: as you begin to learn a process for making decisions, you'll probably find that you have many more worthwhile possibilities to explore for your important decisions than you were ever aware of before. Learning decision-making skills gives you added freedom and control over your life because it increases the range of options you are able to consider. By applying good decision-making skills, decision problems become less troublesome and we are more likely to be satisfied with the choices we make.

THE DECIDES MODEL[1]

STEP	ACTIVITY
1.	DEFINE THE PROBLEM.
2.	ESTABLISH AN ACTION PLAN.
3.	CLARIFY VALUES.
4.	IDENTIFY ALTERNATIVES.
5.	DISCOVER PROBABLE OUTCOMES.
6.	ELIMINATE ALTERNATIVES SYSTEMATICALLY.
7.	START ACTION.

Notice that the first letter of the first word in the above seven steps spells DECIDES as you read down the page. This is a handy way for you to recall the suggested activities and their order when using this model to make important decisions.

[1]From: Krumboltz, J.D. and Hamel, D.A. Guide to career decision-making skills. New York: The College Board, 1977.

The DECIDES Method: Definitions & Examples

1. Defining the problem means to

Describe the decision you must make and name the date or time by which it must be made.

Examples:

"I have to decide which class to take 3rd period by Monday."
"I want to decide on a parttime job within the next 3 weeks."

2. Establishing an action plan means to

Describe the actions you'll take to make the decision. Plan when you'll do each activity and estimate how much time each step will take.

Example:

"Before choosing a parttime job, I'll spend a couple of hours talking to my friends and neighbors and at least three afternoons looking at local job listings in both the newspaper and the State Employment Service. Then I'll give myself 10 days to check out the possibilities and get any more information I need before deciding. I'll apply for at least one job by March 9th."

3. Clarifying values means to

Specify the features or benefits that are important for you to have or experience in your choice.

Examples:

"I want a job that pays at least $3 per hour and lets me work outdoors."
"I want a car that gets good gas mileage (22+ M.P.G.), has front wheel drive, rides very smoothly, and costs less than $5,000."

4. Identifying alternatives means to:

Specify two or more choices or options in a decision situation.

Examples:

"I'll list four jobs which pay at least $3 per hour and let me work outdoors: gardener, lifeguard, window washer, and parking lot attendant."
"I'll examine some cars which meet my criteria. So far I want to consider the Ford Fenderbender, the Plymouth Rock, and the Toyota Goyta."

5. Discovering probable outcomes means to

Evaluate how well each alternative would provide the features or benefits you want in your choice.

Examples:

"I test drove three cars yesterday and found out how each one handled."
"By talking to some salespeople, I found out how much each car would cost with the features I want."
"I talked to my friend, Diane, to find out what it was like for her to be a lifeguard at the city pool last summer."

6. Eliminating alternatives systematically means to

Compare your alternatives to each other until you find the one which appears to give you most of what you really want in your choice. In other words, you want to compare your options until you find the one that best satisfies your values.

Examples:

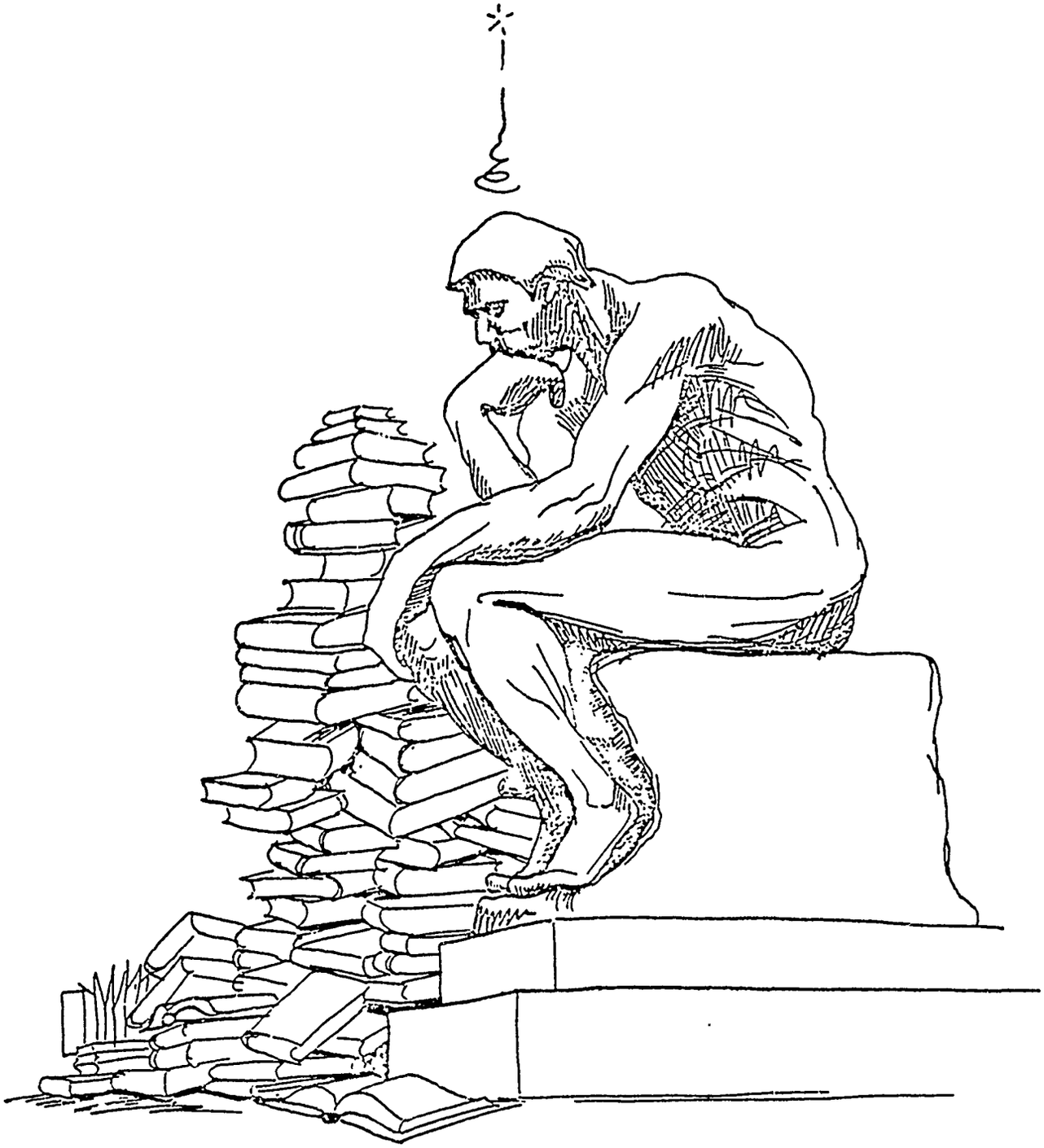
"I've dropped gardening from my list of summer jobs because I can't find any work that pays more than $2.65 per hour. I'll look more closely at my remaining alternatives."
"I had to eliminate the Ford from my list of possible cars because the model I wanted cost $700 too much, and the Plymouth that met my other criteria only gets 20 miles per gallon. That means that either I'll buy the Toyota or find some new possibilities."

7. Starting action means to

Act on your decision by doing whatever is necessary to obtain your desired outcome.

Examples:

"I submitted two applications to be a parking lot attendant, and next Thursday I'll be interviewed for a lifeguard job."
"I have an appointment at 3:30 this afternoon with a loan officer at my bank to discuss a financing plan for the car I've decided to buy."



The DECIDES Model: An Illustration

Although you probably wouldn't spend a lot of time making a simple decision like deciding which book to read tonight, the following example demonstrates how our DECIDES method could be applied to a typical decision situation.

Planning

Steps	Example
1. Define the problem (a) the desired accomplishment, (b) the time limit)	"I want to pick one book to read tonight and make my decision within 5 minutes."
2. Establish an action plan (the activities you expect to perform to reach your decision)	
To clarify values.	"I'll list what I want the book to do for me."
To identify alternatives.	"I'll consider unread books on my bookshelf."
To discover probable outcomes.	"I'll read the first page of certain books."
To eliminate alternatives systematically.	"I'll discard unsatisfactory books one by one until I find the best."
To start action	"I'll begin reading."

Carrying Out the Plans

3. Clarify values (hoped for benefits)	"I want a book that is (1) short, (2) light and entertaining, (3) a detective story, and (4) easy to read."
4. Identify alternatives (list possible choices)	"I'll consider these 5 books."
5. Discover probable outcomes	"I'll make a grid to see which books satisfy my values." "I'll read the first page of certain books. Ugh, this one is boring."
6. Eliminate alternatives systematically	"I'll discard this book because it's too long."
7. Start action	"Now that I've found the best of all available books, I'll start reading."

JIM'S SUMMER JOB

This is a story about how one person uses the "DECIDES" model to make a particular decision. Jim is a high school junior in Palo Alto who is deciding on where to apply for summer jobs.

Read how Jim begins his decision-making process. You will be asked later to help him finish it.

Jim's problem is familiar to all of us. Think about your own experiences as you read. How would your approach to the problem be similar and how would it be different?

It is now February and Jim wants to decide what summer jobs he should apply for. Although he senses that this may not be one of the most important choices in his life, he wants to make it carefully. If he chooses a bad job, he will not ruin his life, but he realizes a poor decision could make his summer very unpleasant.

How important is the decision?

What are the consequences?

Last year Jim spent only 5 minutes making a decision about a summer job. June crept up on him and all of a sudden he needed a job immediately. Otherwise, his mother would be nagging him every morning until he found some work. So when a friend mentioned that a local supermarket was looking for cashiers, he went right down there and was working the next day.

Jim paid for his hasty decision. It was a boring summer for him. He strongly disliked being indoors all day, standing in one place, and listening to irate customers. "This summer I will make a better job choice," he resolved.

An impulsive decision that turned out poorly

Jim discovered that a course in decision making was being offered at his high school. He wondered if he could use the course to help him make a good decision on what jobs to apply for this summer. He reasoned, "I ruined my last summer because I jumped into something without any thought. I'm

sure that I could have made a better decision that would have resulted in a more satisfying summer. Maybe this decision-making training will help. I'll give it a try."

After the first class, Jim looked over the decision-making steps.

Define the problem
Establish an action plan
Clarify values
Identify alternatives
Discover probable outcomes
Eliminate alternatives systematically
Start action

It made sense to him to use these steps for his summer job decision. He imagined that he might use the model even more extensively if he was deciding about long term employment. However, if he was deciding what kind of coat to buy, he would probably use the steps less extensively, and in choosing what to eat for lunch, he wouldn't use them at all.

Know when and how to use the model.

Jim was also prepared to use the model in a flexible way. For example, if while he was "Identifying alternatives", he felt that some of his values were still unclear, he would recycle back and spend more time clarifying his values.

Use the model in a flexible way.

DECISIONS THAT I MAKE

Look over your "Personal Decision Log" listings as you enter them in the last section of this Notebook. For now, try separating them into fairly routine, day-to-day decisions in one group, and decisions that seem more important into another.

Some Routine Decisions	Some Bigger Decisions
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.

Can you list some other "big" decisions that you've made recently or will be facing very soon?

You might want to use the above "Bigger Decisions" list to help you find the decision problem you want to work on for the rest of this course. Remember, you are to write a brief description of that decision between now and our next class. It should be an important decision about your plans after graduation from high school, and might involve college plans, where you'll live, whether or not you want to find a job, what kind of work you'd like to do, etc.

DESCRIBING MY DECISION

Week 1

I. A major decision I must make within the next year:

DECISION LOG

Date	Decision to be Made	By when?	How Important? 1-10 10=very	Alternatives	Final Choice	How Satisfied? 1-10 10=very	Comments

Lesson #2

Define the Problem

JIM'S SUMMER JOB (Contd.)

This step was rather easy for Jim in this particular situation. Often, however, a person may feel there is a need to make some kind of decision, but have difficulty in expressing it clearly. A couple of years ago, Jim went through a period where he did not feel very happy. He felt that there must be some decisions that he should make but didn't know where to begin.

After much thinking and talking to others, he realized that he had not been engaging in any enjoyable activities for some time. Following this realization, he could then state an appropriate decision to be made in clear terms.

Identify a problem situation.

At the time he told himself, "I want to find several spare-time activities that will be enjoyable to me. I plan to come up with a list of "enjoyable activities" by September 1st." Without realizing it, Jim had made an important first step toward a good decision. These days Jim knows how to enjoy himself.

State a problem in clear terms with a tentative time table.

As mentioned, Jim actually had little difficulty in defining his current problem. After a little thinking, he wrote down:

"I will come up with 3 interesting summer job possibilities that I will apply for by May 1st."

ACTION PLAN / BANK DECISION

I. Define the problem.

II. Establish an action plan.

III. Clarify values.

IV. Identify alternatives.

V. Discover probable outcomes

VI. Eliminate alternatives systematically.

VII. Start action.

BANK BROCHURES

- Bank A -

We at Bank A pride ourselves on providing fast and friendly service.

For your convenience we offer:

- a drive-up window
- a special "no-bounce" checking plan
- special weekend hours - we are open until 9:00 p.m. on Fridays and 9:00-12:00 on Saturdays
- unlimited checking - write as many checks as you want for just $2.00/mo.

COMMENTS: 5 people in line

1 mile from my home

- Bank B -

It is a pleasure to serve you with a checking account at Bank B. At Bank B you will find a special checking account to fit your personal needs. If you usually write less than 30 checks per month you will like our "economy plan". There is no monthly service charge -- you pay only 5¢ for each check you write.

We also offer long banking hours for your convenience. We are open until 9:00 p.m. Fridays and from 9:00-12:00 Saturday mornings.

COMMENTS: 4 people in line

3 miles from my home

- Bank C -

Come to a bank you can count on. We at Bank of C are experienced in the field of banking. We think you will like our special services, too. We provide free checking accounts with no minimum balance requirements. We know that time is important to you. That's why you'll find branches of Bank C all over California, and every branch is open until 9:00 p.m. on Friday nights.

COMMENTS: 14 people in line
3 miles from my home

BANK VALUES GRID

Values	Values in Question Form	BANK A	BANK B	BANK C
1) Low Charge for Service	1) How much does checking account cost?			
2) Quick Service	2) How many people were standing in line?			
3) Close Location	3) How close is bank to my home?			
4) Extra hours on Friday or Saturday	4) What are the bank's hours on Friday or Saturday?			

ALICE'S PROBLEM

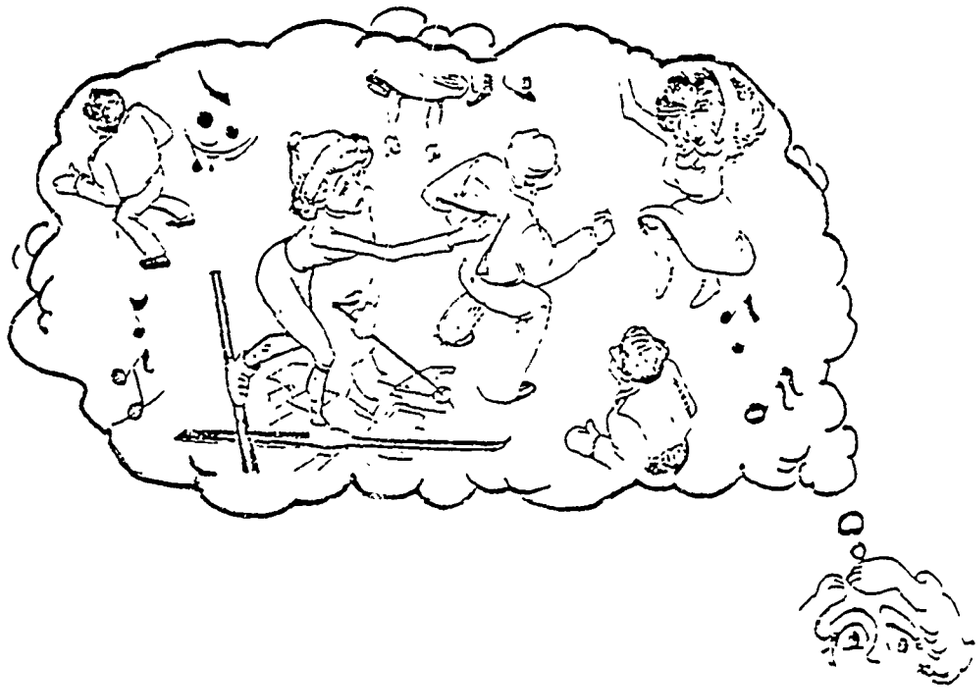
Directions: Interpret and discuss the following brief passage with one or two other people in our class. Then see if you can agree on one or more good ways of "defining the problem" facing Alice. Write your problem definition(s) in the space at the bottom of this page.

Alice seems to be walking in a daze between her 5th and 6th period classes. Although it's Thursday afternoon and she'd normally be getting excited about her plans for the weekend, she feels confused and uneasy.

Alice has been dreading the weekend because she needs to spend a lot of time working on a history paper due next Wednesday. However, yesterday her friend, Karen Brown, invited her to spend Friday afternoon and all day Saturday skiing with the Browns at their Lake Tahoe cabin.

This ski trip seemed like a great opportunity, but then just an hour ago at lunch Pat had invited her to a fantastic party on Friday night. What should she do?

Karen was a lot of fun, and this might be her only chance to go skiing all year. If she went on the ski trip, she'd miss Pat's party and another history class Friday afternoon. The history paper would be almost half her grade this quarter. She wondered if the paper would be written on time since she still had quite a bit of reading to do before she could start writing it.



LET'S GET SPECIFIC

Listed below are five vague and unclear statements referring to decision problems. Change each statement into a more clearly defined decision situation. Remember that almost any given decision problem can be defined in a number of different ways.

Example:

I wish I could figure out how I'm going to spend Spring vacation.

Spring break begins in just five weeks. Three weeks from today I will have investigated some possibilities and make a decision about how and where I'll spend that period of time.

1. I want to get the best job I can.

2. I need to find some good classes.

3. Pretty soon I will find something to do this Summer.

4. I should change my life before I get much older.

5. I have to decide about the future.

Which of the above statements is your best effort at writing a clear problem definition? What makes it better than the others?

DEFINING MY DECISION PROBLEM

Week 2

II. Now that you've had some practice in defining problem situations more clearly, what might be a better way to "define the problem" for the major decision situation(s) you described last week?

Lesson #3

Establish an Action Plan

JIM'S SUMMER JOB (Contd.)

Establish an Action Plan

An action plan is a tentative guide for all the steps between the definition of the problem and the actual carrying out of the decision. It helps in organizing and spacing activities so that the decision proceeds smoothly and on a schedule.

Jim sat down and wrote out his plan of action with tentative deadlines that seemed reasonable. With each step he asked himself, "What actions can I take to successfully complete this step?"

JIM'S SUMMER JOB (Contd.)

Action Plan - Summer Job

Clarify Values (by March 1st)

1. Think about and list activities I enjoyed and things that were important to me in past summer work.

2. Talk to friends, family and other people about what they like and dislike in a summer job.

3. From ideas I get from these actions I will write a list of my most important values for a summer job.

Identify Alternatives (by March 20th)

1. Talk to friends — find out what summer jobs they have had.

2. Go to an employment office and read the job vacancies posted there.

3. Brainstorm — write a list of the jobs that I know are available in the Palo Alto area.

Discover Probable Outcomes (by April 1st)

1. Imagine myself in each job situation. What are the positive and negative experiences I expect?

2 Judge how well each job fits my values

3 Talk to people who have had these jobs and find out if I have a realistic understanding of what each one would be like.

JIM'S SUMMER JOB (Contd.)

Eliminate Alternatives Systematically (by April 15th)

1. Drop the least favorable alternatives.
2. Explore remaining alternatives more thoroughly.
3. Delete more alternatives until I am left with the 3 best ones.

Start Action (by May 1st)

1. Complete any necessary application forms.
2. Prepare a resume.
3. Arrange an interview (if needed) for each of my job prospects.

A SAMPLE ACTION PLAN [1]

Career Decision Making

Action Plan for *Paul* Today's Date: *Sept. 15*

Steps	Actions	Completion Date
1. Define the problem		
	Name at least one possible job related to my interests and abilities	*Sept 15*
2. Establish an action plan		*Sept. 15*
3. Clarify values		
	a. Talk with friends, parents, and other people about what's important in a career	*Sept. 25*
	b. Take part in some values clarification exercises	
	c. Write a statement of what's important to me	
4. Identify alternatives		
	a. Take an interest inventory	*Oct. 10*
	b. Use job-screening system	
	c. Consult books and pamphlets about jobs	
	d. Take an aptitude test battery	
	e. List jobs I've already done successfully	
5. Discover probable outcomes		
	a. Explore job simulation experiences	*Nov. 5*
	b. Talk with people employed in occupations that I'm considering	
	c. Read descriptions of occupations	
	d. Estimate my chances for success in each job	
	e. Judge how well each job fits my values	
6. Eliminate alternatives systematically		
	a. Delete least feasible alternatives	*Nov. 10*
	b. Explore remaining alternatives more thoroughly	
7. Start action		
	Begin investigating possible training opportunities or listing potential employers	*Nov 15*

List the specific decisions you want to reach and the target dates by which you will reach them.

List actions and deadline dates for accomplishing each step.

List activities that will help you discover and state what you really want from your decision.

List possible actions that will help you find some appropriate opportunities. A counselor, reference books and your own imagination can suggest some possible alternatives. List your own current skills.

Use any source of information or experience that will help you find out what an alternative would be like for you.

Revise your plan as you go along. Each new experience you have may suggest other alternatives or actions to you.

After evaluating your information, get rid of the least desirable alternatives first. Then re-evaluate those remaining.

Plan to take action. A decision hasn't been made until you do something about it.

[1] From: Krumboltz, J.D. and Hamel, D.A. Guide to career decision-making skills. New York: The College Board, 1977. Used by permission of the College Board.

ACTION PLAN for my "big" decision

Week 3

III. Some actions I can take to simplify the decision I want to make.

Steps (Actions--you fill in)	Completion Date
Define the problem (copy from last week's exercise)	_____
Establish an action plan (you're doing that now)	_____
Clarify values (what actions can you take to learn what's important to you in this decision situation?)	_____
Identify alternatives (what can you do to find some options?)	_____
Discover probable outcomes (what can you do to find out what choosing each of your options would be like?)	_____
Eliminate alternatives systematically (how can you narrow your alternatives down to the best possible choice?)	_____
Start action (what actions will you take to make your decision happen?)	_____

Lesson #4

Clarify Values

JIM'S SUMMER JOB (Contd.)

Clarify Values

Jim began this step on a Saturday in March. That afternoon he reviewed his past jobs and activities in light of his values.

His first job was mowing lawns. That was 6 years ago. He thought about what he liked and disliked about it. For one thing, he liked working outdoors and the physical exercise. He valued working in the clean air and sunshine and got a sense of accomplishment from seeing a yard well cut. He liked working independently. He did not like the responsibility of having to repair broken equipment.

Identify the benefits or features you most want to have in your choice.

Last summer he discovered several other things he did not like. At the end of each day he felt exhausted from ringing the cash register. He often wondered why just pressing keys tired him out more than pushing a lawn mower all day. Now it seemed clear to him. It was the boredom that tired him. The endless stream of cash receipts did not satisfy him as much as seeing a freshly mowed lawn.

To further clarify his work values, Jim made a point of asking others what they looked for in summer work. Of course, many people mentioned things he did not find important. His best friend, Ralph, for example, cited "having Fridays off" as one of his highest values. Last summer Ralph worked in a job that he did not like just because it was easy to get Fridays off there. Jim thought Ralph had made a foolish choice.

One of Jim's teachers said something that made sense to him. She reminded him that if he was going to go to college after graduating from high school, he would be needing quite a bit of money. Thus, another value for summer work was "making a good salary".

Jim gathered up all his notes from speaking to people and reviewing his values in past jobs. He wrote down the following list and ranked each value in order of importance.

My Values in a Summer Job

1. Outdoor work
2. Making things more beautiful
3. Getting physical exercise
4. Independence — working mostly on my own
5. Money — higher than minimum wage

Some Work Values and What They Mean

Early Entry represents the extent to which you can enter an occupation quickly without spending much time preparing for it.

If your occupation has high early entry, you can begin work with very little education or training in advance. You can begin earning income right away.

If your occupation has low early entry, you will have to spend many years in training or education. You will be delayed longer than most in beginning to earn your own living.

Helping Others is the extent to which you directly help people face-to-face as part of your occupation.

If your occupation offers a high opportunity to help others, you would spend most of your time working directly with people to improve their health, education, or welfare.

If your occupation offers a low opportunity to help others, you may do work that is indirectly useful to others without seeing those who benefit, and/or your primary loyalty is to your employer (or your own self-interest).

Income is the amount of money you earn in an occupation.

If your occupation offers high income, you would earn much more than you would in most other occupations.

Low income means you would earn less than you would in most other occupations, though still enough to live on.

Independence is the extent to which you make your own decisions and work without supervision or direction from others.

If your occupation offers high independence, you would be your own boss.

Low independence would mean working under close supervision carrying out the decisions of others.

Leadership is the extent to which you guide others, tell them what to do, and are responsible for their performance.

If your occupation offers high leadership, you would direct activities and influence people. You would also accept responsibility for the performance of the people you direct.

With low leadership you would not direct other people and you would not be responsible for their performance.

Some Work Values and What They Mean (Contd.)

Leisure has to do with the amount of time your occupation will allow you to spend away from work.

In an occupation which has high leisure, you will have short hours, long vacations, and the chance to choose your own working hours.

With low leisure you will often work long hours, perhaps nights and weekends, with short vacations and limited choice of hours.

Prestige is the degree to which an occupation commands respect in people's minds.

An occupation with high prestige is one which most people look up to.

An occupation with low prestige is one which does not command general respect.

Security concerns the degree to which your occupation and income are protected from hard times or new labor-saving inventions.

With high security you would be reasonably sure of keeping your job and income.

With low security you might easily lose your job and income.

Variety concerns the extent to which your work activities involve you in doing different things, in different places, with different people.

If your occupation offers a high amount of variety, you would find yourself frequently doing different kinds of things, interacting with many different people, and/or working in many different places.

Low variety would mean doing mostly routine and repetitious work with the same co-workers in the same place every day.

The Fall-Out Shelter Problem[1]

PURPOSE

"This is a simulated problem-solving exercise. It raises a host of values issues which you must attempt to work through in a rational manner. It is often a very dramatic example of how our values differ; how hard it is to objectively determine the 'best'values; and how we often have trouble listening to people whose beliefs are different from our own.

PROCEDURE

The class will be divided into groups of four, who then sit together. You will work on the following problem:

Your group are members of a department in Washington D.C. that is in charge of experimental stations in the far outposts of civilization. Suddenly the Third World War breaks out and bombs begin dropping. Places all across the globe are being destroyed. People are heading for whatever fallout shelters are available. You receive a desperate call from one of you experimental stations, asking for help.

It seems there are ten people but there is only enough space, air, food, and water in their fallout shelter for six people for a period of three months - which is how long they can safely stay down there. They realize that if they have to decide among themselves which six should go into the shelter they are likely to become irrational and begin fighting. So they have decided to call your department, their superiors, and leave the decision to you. They will abide by your decision.

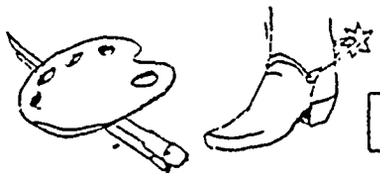
---

[1] Copied from an exercise in Values Clarification by S.B. Simon, L.W. Howe, and H. Kirschenbaum. New York: Hart Publishing Co., Inc., 1972, pp. 281-286.

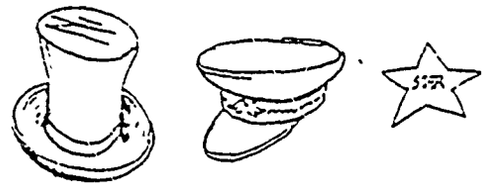
But each of you has to quickly get ready to head down to your own fall-out shelter. So all you have time for is to get superficial descriptions of the ten people. You have half-an-hour to make your decision. Then you will have to go to your own shelter.

So, as a group you now have a half-hour to decide which four of the ten will have to be eliminated from the shelter. Before you begin, I want to impress upon you two important considerations. It is entirely possible that the six people you choose to stay in the shelter might be the only six people left to start the human race over again. This choice is, therefore, very important. Do not allow yourself to be swayed by pressure from the others in your group. Try to make the best choices possible. On the other hand, if you do not make a choice in a half-hour, then you are, in fact, choosing to let the ten people fight it out among themselves, with the possibility that more than four might perish. You have exactly one half-hour. Here is all you know about the ten people:

1. Bookkeeper; 31 years old
2. His wife; six months pregnant
3. Black militant; second year medical student
4. Famous historian-author; 42 years old
5. Hollywood starlette; singer; dancer
6. Bio-chemist
7. Rabbi; 54 years old
8. Olympic athlete; all sports
9. College co-ed
10. Policeman with gun (they cannot be separated)"



PEOPLE I ADMIRE

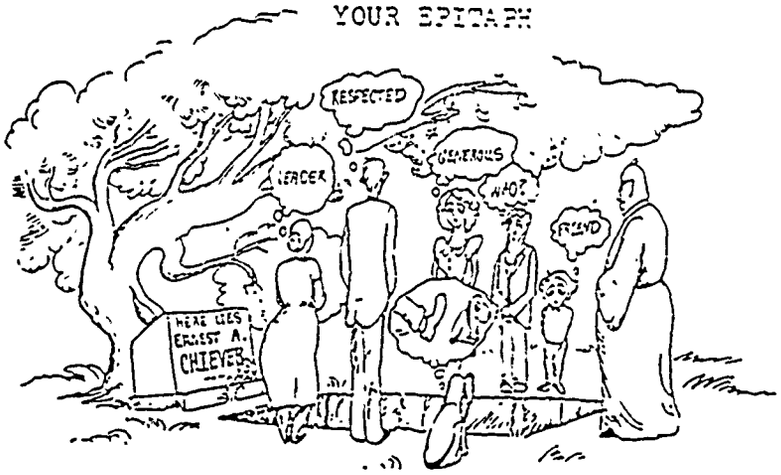


List at least three significant people in your life who you admire. These people might include a close friend, relative, coach, famous personality, or teacher. Why do you like them? What are their most important values as you see them?

Pick one of these three people to interview. Try to find out how this person became aware of his or her values and how he or she describes them.

Some People I Admire	Their Values
Example:	
Mr. Hayes, Soph. math teacher	likes to help people, very independent, greatly enjoys his leisure time
1.	
2.	
3.	
4.	

YOUR EPITAPH



Imagine that it is the year 2040 and your long life has just ended. A group of people has gathered to commemorate what you represented to them.

Think about how you would like to be remembered. What values would you like people to associate with the way you lived? What do you want them to believe was important to you in life?

Complete the following remarks (using 2 or more sentences) made by people who knew you well.

1. One of your high school English teachers recalls what you valued most as a student.

   "She (he) was . . .

2. Your supervisor from your first job after you finished school comments on what it seemed you wanted from life.

   "By the way he (she) worked, it seemed that . . .

3. A group of co-workers from the various jobs you've held agreed that you strived to achieve c rtain common goals, regardless of your work setting.

   One of them summed it up this way, "Yes, I can still remember how important it was to her (him) to . . .

YOUR EPITAPH (Contd.)

4. Several lifelong friends recall events that seem to reflect the things you most enjoyed and strived to achieve.

One of them says, "

Now look over the statements made by each of these four people. List each value that was mentioned.

1.

2.

3.

4.

5.

6.

7.

8.

9.

Think about each value and what it means to you. Narrow the list down to the four or five that you consider are your most important work values.

1.

2.

3.

4.

5.

MY VALUES

Week 4

IV. Some benefits I hope to gain in making this decision. In other words, a list of my value preferences that are important in making this choice:

1.

2.

3.

4.

5.

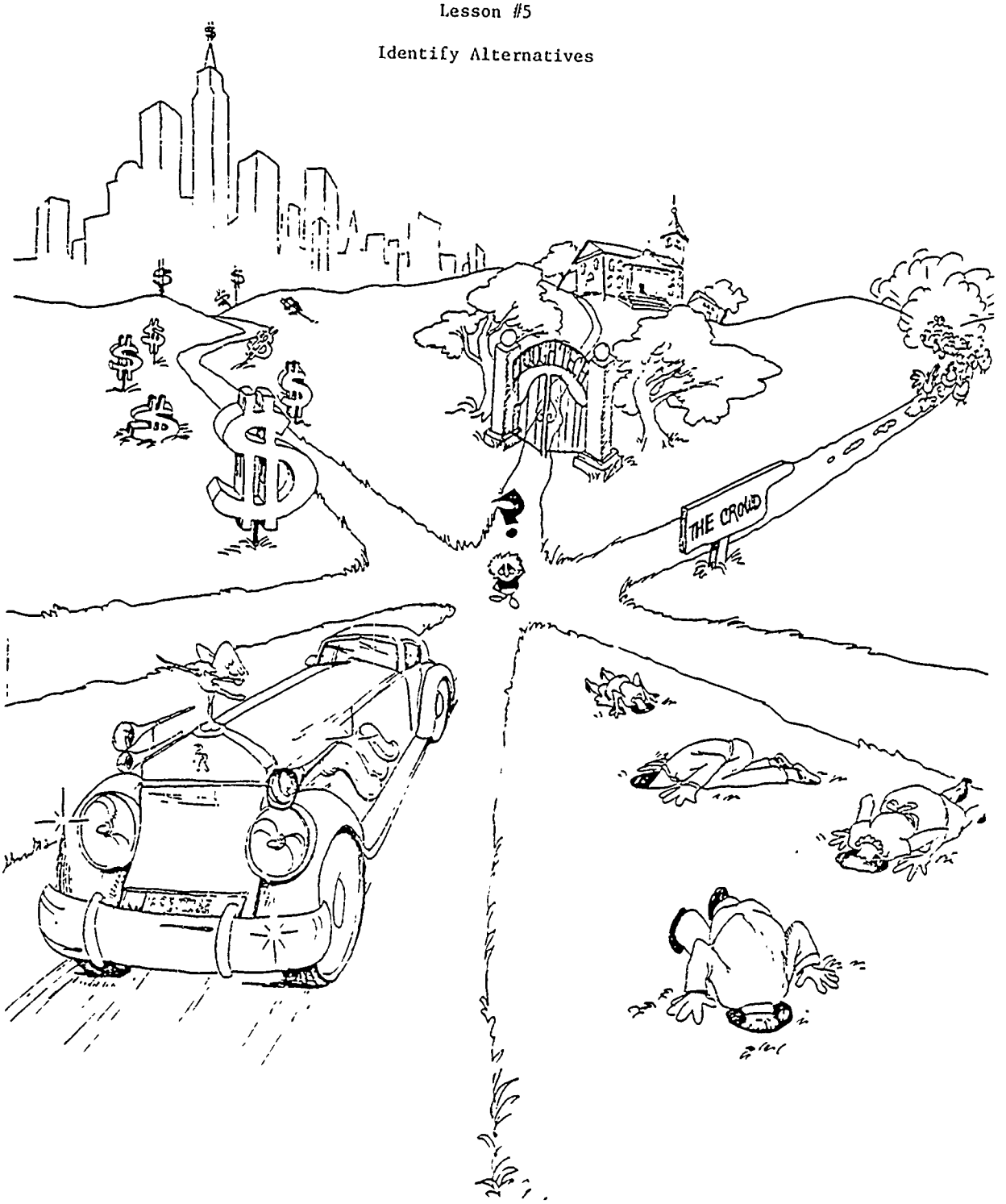
6.

7.

8.

Lesson #5

Identify Alternatives



IDENTIFYING ALTERNATIVES FOR JIM'S SUMMER JOB

For the past few weeks you've been reading about Jim, a student much like yourself, who is thinking about what he wants for a summer job. From your general impression of Jim and what you've learned about him so far, try to list at least six jobs he might consider.

Remember, as you discuss Jim's prospects in your group, brainstorm some possibilities that actually exist in the Palo Alto area.

1.

2.

3.

4.

5.

6.

MY ALTERNATIVES

Week 5

V. Some alternatives I have found:

Alternative	Information Source
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

What resources did you use to discover these options? Books or catalogs? Talking to people? Radio or TV? Your school's Career Center? Which sources were most helpful?

DISCOVERING PROBABLE OUTCOMES FOR JIM'S SUMMER JOB

1. Jim's story ended when he wrote a list of his five most important work values. Find those values and write them under the column labeled "Values" below. The first one is already listed.
2. Now make a question out of each value that someone might ask about a job. Again, the first one is done for you.
3. Next, list the six alternatives your group came up with last week for Jim under the "Alternatives" columns numbered 1-6.
4. Finally, answer each value question for all six alternatives by filling in all of the boxes in the grid below.

Alternatives

Values	Value Questions	1	2	3	4	5	6
1. Outdoor work	How much time will I spend working outside?						
2.							
3.							
4.							
5.							

DISCOVERING PROBABLE OUTCOMES for my "Big" Decision

Week 6

VI. You are now ready to start investigating the alternatives that you listed. Remember, the idea here is to try and find out as best you can what it would actually be like to experience each of your options. Use the values you listed for Exercise IV to ask questions that will guide your search. Use the information you gather to fill the spaces in the grid below:

ALTERNATIVES

Value	Value Question	1	2	3	4

Lesson #7

Eliminate Alternatives Systematically
and
Start Action

ELIMINATE ALTERNATIVES FOR JIM

Now that you've had a chance to see how well each of Jim's alternatives satisfies his values, try to eliminate the three least favorable summer jobs for him.

Start by crossing out the least attractive option (you can actually do this on your values/alternatives grid sheet). Which alternative would you eliminate next? And next?

Now, list the three remaining jobs that you think Jim should apply for.

1.

2.

3.

ELIMINATING ALTERNATIVES for my "BIG" DECISION

Week 7

VII. Now that you've filled in a grid with some information about how well each of your alternatives satisfies each of your personal work values, you can begin eliminating some of your options.

Which alternative can you eliminate first?

And next?

How will you arrive at what seems to be your best choice or choices?

What will you do next?

APPENDIX D

MASTER LESSON PLANS FOR UNITS 1-7 OF A CAREER DECISION TRAINING PROGRAM

LESSON PLAN

Session #1: Overview February 28, 1979

: GO EASY TODAY!! This first class is a chance to become acquainted, build rapport, and set a positive tone for subsequent sessions.

Objectives: For this first group meeting, you'll have about 45 minutes to accomplish three things: (1) introductions, (2) distribute workbooks and provide an overvie of the program, and (3) introduce the DECIDES model.

Methods:

I. Getting Acquainted
   A. Take roll--we're required to do this for every class
   B. Introduce yourself
      1. Sketch your background, interests, and what you're presently doing--the kids want to know about this
   C. Ask students to introduce each other
      1. Emphasize that we're beginning a new program together, and that much of what we learn will be through shared exper.
      2. Divide group into pairs. Ask them to chat for 2 or 3 minutes, and try to learn something interesting about the other person.

   Note: (a) If odd number of students present, instructor should pair up with one of the students.
   (b) If you have a favorite "ice-breaker" exercise, feel free to substitute it for the one above or add here.

II. Overview of the Curriculum
   A. Distribute workbooks
      1. Allow kids several minutes to thumb through
      2. Emphasize we'll only be using a few pages each week
   B. Mechanics of program
      1. Meet here every Wednesday at this time for next 6 weeks
      2. Attendance required--roll will be taken and reported, just as in other classes
      3. Stress importance of regular attendance--most of the work we do will take place in class--only way to really learn the material
   C. Contents of program: 3 parts
      1. Assigned reading; very little of that--most of it 1st week
         a. Jim's story--1-3 pages each week
         b. Occasional definitions and examples to explain the exercises
      2. Things you do in class--mostly group discussions about decision-making experiences, but several exercises as well
      3. Things you do outside of class: Homework
      Most of this will be fun and take very little time, but it will be important to get done.

III. General Points

A. Focus will be on your personal decisions. A chance to learn a process for taking action on your own decision problems here and now.

B. We'll be learning one method for approaching decision tasks. Remember that it may be a new procedure for you, and may not even be the best way for you to make decisions. Give it time. Our real goal is to gain some experience with this method, and find the kinds of decision situations where it seems to work best.

C. There probably is no one best way to make decisions. It is important for you to realize that most people have real difficulty making at least some of the important choices in their lives.

I'll be sharing some of the problems and frustrations that I've experienced with my own decision-making. I hope you'll do the same. We can all learn a great deal by seeing how others cope with decisions similar to our own.

IV. Materials

A. Assign introductory reading (8 pages)
   1. "Introduction" (2 pp)
   2. "The DECIDES Model"
   3. "The DECIDES Method: Definitions and Examples" (2 pp)
   4. "The DECIDES Model: An Illustration"
   5. "Jim's Summer Job" (2pp)

B. Homework exercises
   1. "Decision Log"
      a. Provide several sample entries in class. Ask them to record one of these for future reference.
   2. "Decisions That I Make"
   3. "Describing My Decision"
      a. Emphasize importance of this choice--i.e. this decision problem will be worked on for the rest of this course.

V. Introduce DECIDES model

A. Use poster for quick overview
   1. Refer students to "The DECIDES Model"page in workbooks
   2. Go over 7 separate steps that form an acronym--explain acronym as a way to remember something

B. Explain steps briefly
   1. Refer to "The DECIDES Method: Definitions and Examples" page in workbooks

C. Ask for questions, comments

D. Refer to book example, "The DECIDES Model: An Illustration" page in workbooks.

Note: Run through this example if you like.

LESSON PLAN: Session #1 (cont)

VI. Discussion Period (if time)

A. Ask students to name decisions they must make on a daily basis (list on board)
B. Ask students to name life's most important decisions (list on board)
C. Ask students to name some important decisions they must make within the next year (list on board)
D. How do you know if you've made a good decision? (list characteristics on board)

VII. Review of work to be done (by next Wednesday, March 7th)

A. Reading
B. "Decision Log"
C. "Decisions That I Make"
D. "Describing My Decision"--very important; think over carefully

Note: If you have time left over or the Discussion Period does not seem to go, just ask them to get started on their assignment and circulate around the group to answer questions and offer encouragement.

LESSON PLAN

Session #2 March 7, 1979

OBJECTIVES:

The major goals of this second lesson are to: (1) review last week's work, (2) see that each student has at least one appropriate major decision to work on, (3) provide guided practice with the DECIDES model by involving the group in the "checking account" decision, (4) give the students practice in formulating problem definitions, and (5) review work to be done for next week.

METHODS:

I. Review of past week's work

A. Ask students to share "Dec. Log" and "Dec. I Make" entries

B. List the "bigger" decisions on board

C. Ask if everyone has picked a major decision to work on

1. If not: (a) suggest that they consider the kinds of decisions others have mentioned, and (b) involve the group in brainstorming another 10 or so options

2. Note: You may want to generate you own list now in case it is necessary to "prime the pump"

3. Emphasize importance of selecting and describing a decision situation by the end of today's class

II. Model use of DECIDES method with bank example

A. Describe decision problem--opening a checking account

B. Refer S's to appropriate workbook forms: action plan, 3 bank brochures, and values/alternatives grid

1. Make sure they make appropriate entries on their action plans and grid forms as you model the process

C. Complete guided practice--solicit S's help w/ each step

Session #2 (cont)

III. Review "Define the Problem" (briefly)

A. What does it mean? (Ask S's)

B. What happens if you don't define a decision problem? (Ask S's)

1. Delaying until too late (Ask S's for example)

2. Allowing others to decide (Ask S's for example)

C. Emphasize: (1) variety of ways to define any decision problem, and (2) problem statements are <u>not</u> either clear or unclear, but can be made less vague

1. Example: "I want to decide how to become a success." (Ask class to improve)

IV. Small group activity--"Alice's Problem"

A. Divide class into 2 groups

B. Ask them to read and discuss "Alice's Problem", and then write on or more problem definitions of the decision facing Alice

C. After 10 min., reconvene and discuss with entire class

V. Assign work for next week

A. Read "Jim's Summer Job": Define the Problem--1 page

B. Review the checking account exercise. How might you have done this differently?

C. Do "Let's Get Specific" exercise

D. Do "Defining My Decision Problem" exercise

E. As you define your decision problem, start thinking about what needs to be done to make it, because next week we'll spend most of our class period working on <u>your</u> Action Plan

<u>Note</u>: Suggest you visit school's Career Planning Center located in the Library (turn left after entering Library). This facility is operated under the direction of Ms. Jan Martino.

LESSON PLAN

Session #3 March 14. 1979

I. Review of past week's work

A. "Let's Get Specific" exercise

1. Ask for comments or questions--perhaps ask several students to volunteer their revised versions of one or more of the statements

2. Ask S's to write their names on top of page & hand-in

B. "Defining My Decision Problem"

1. Everyone do it? Any problems?

2. Note: Meet with any kids who either didn't do it or had difficulty while others work on their action plans later in the session

C. Bank Example (applies primarily to Dan's class)

1. Which bank did you pick for me and why?

2. How did you arrive at this choice?

II. Discussion of action plans

A. What is an action plan?

1. Purpose? How to build?

2. What does one look like? Refer to:

a. Jim's (Summer Job story)

b. Paul's ("A Sample Action Plan")

B. When is an action plan helpful?

1. Kinds of decisions where you wouldn't bother with one?

2. Decisions where planning actions is useful?

III. Working on individual action plans (main focus of this session)

A. Refer class to Action Plan for My "Big" Decision forms in their workbooks

1. Have them copy their problem definition in the appropriate space here

2. Suggest that it may be helpful to refer to the sample action plans (Jim's & Paul's) as they work on their own today

B. Divide class into pairs

1. Have S's explain to each other the nature of their big decision problems

2. Ask them to start working on their action plans, and to ask each other for help and suggestions as needed

3. Circulate around group, spending about 5 minutes with each pair of students, making sure all have defined their problem adequately and understand the purpose and nature of an action plan

IV. Assign work for next week

A. Read and review:

1. "Jim's Summer Job"--Establish an Action Plan and Clarify Values sections

2. "A Sample Action Plan"

3. "Some Work Values and What They Mean"

B. Complete action plan begun in class today

V. Optional activities, exercises

A. Some individuals in your class may be actually working through a decision right now. Ask them to fill out a simple action plan and values/alternatives grid (forms provided) and report their experience to the group next week.

B. Take class to the Career Planning Center

LESSON PLAN

Session #4 March 21, 1979

Objectives: We want students to: (1) understand the concept of values and how they affect our lives; (2) begin clarifying their own values and to recognize several strategies for doing this; (3) see the influence of values on the decision-making process; and (4) participate in a forced choice, structured exercise in which they must not only make some decisions as a member of a group, but communicate and even defend their preferences to other group members.

Materials: Student Workbooks--materials for Week 4
Guidelines for "Fall-out Shelter" exercise
"Personal Work Values" exercise sheets

Steps:

I. Review of past week's work

A. Action plans--should be completed by now (check with S's absent last week to make sure they understand assignment) Questions? Problems? Comments?

B. Assigned reading

1. "Jim's Summer Job": What were his work values and how did he become aware of them

2. "Work Values" listed and defined in our Workbook (early entry→variety)

a. What do, say, early entry, prestige mean?

b. Are there other work values important to you that are not on this list?

II. How does one clarify values?

A. What activities did you list on your action plans?

1. Instructors might begin this by sharing some of their own listings.

Session #4 (continued)

2. Ask S's to share their plans and encourage others to help by suggesting additional activities

B. Values clarification exercises (in class)

1. "Fall-out Shelter"

a. Divide into 2 groups (if 5 or more S's present); Each group works independently for 15-20 min.

b. Groups convene to share decisions, reactions and perhaps discuss/argue differences

2. "Personal Work Values" exercise--allow up to 5 min.

III. Assign work for next week

A. "People I Admire" exercise

1. Emphasize importance of talking to one of these people

2. Model use of some open-ended questions to use in the interview: e.g. How did you become aware of what you wanted to gain from your life's work? What do you most like about what you're presently doing? Least like? How has what's important to you in your work changed over the years?

B. "Your Epitaph" exercise

C. "My Values" exercise for their major decisions

D. Announce that next week you'll meet in your regular classroom, take roll, and then move on for an orientation to the Career Planning Center.

LESSON PLAN

Session #5 March 28. 1979

Today's class will consist mainly of an orientation to the Career Planning Center conducted by Jan Martino. In addition to providing an overview of the materials available there, Jan will demonstrate the use of the Guidance Information System (GIS) terminal, and give each student a brief assignment on the GIS to complete during the next week.

I. Before the tour--in your classroom

A. Take roll

B. Review last week's assignments: questions? problems?

1. "People I Admire"

2. "Your Epitaph"

3. "My Values"

C. Dismiss to Career Planning Center

II. Tell Jan you need the last 5 minutes of the period

A. Assign

1. "Identifying Alternatives for Jim's Summer Job" (Should be completed working with at least one other member of the class)

2. "My Alternatives" (for major decision problem)

B. Remind S's to meet in regular classroom next Wednesday

LESSON PLAN

Session #6 April 4, 1979

This is our next to last session, and our final full instructional period. Much of our last session will be spent administering the CLDMA and a class evaluation form and signing kids up for appointments to take the CDS.

What's the best use of our remaining 70 or so minutes? Rather than present you with a structured agenda, I've proposed the following list of possible activities. Let's discuss these items, and see if we can agree on our priorities and a reasonable sequence.

1. Review of Career Planning Center orientation:

--What did you learn there?

--Some kids will have completed an occupational search on the GIS. Ask them to share their findings.

--What stage(s) does use of the CPC library represent in decision making?

--What other ways are there to identify alternatives? What other activities did you list on your action plans?

2. Using a grid system:

--What can we do once we know our values and our alternatives for a decision? (make a grid)

--What can we do with information we gather relating to those values and options? (fill in the cells of the grid)

--Note: need to illustrate with concrete example such as Jim's summer job quest or one of your own choosing.

Session #6 (cont.)

3. Jim's Summer Job Example:

--He's already listed his values for you in your workbook. Last week you were asked to identify some alternative jobs for him. Using the grid form provided, fill in the spaces for Jim's values and the alternatives you listed for him (ask S's who didn't already list alternatives to get together for 5 min. and brainstorm a list).

--Now make a question out of each of Jim's values that he might ask about potential jobs. Answer each of these questions for all of the alternative jobs you listed for Jim. You may work in pairs or small groups to do this.

--By answering a set of values questions for each of Jim's alternatives you have been discovering probable outcomes (reference step of model on wall chart).

--Next try to find the best option for him. How will you do this? One method is explained on the page labeled "Eliminate Alternatives for Jim" You may prefer another method.

4. Discovering Probable Outcomes for your "Big" Decision:

--Using a grid to list values and alternatives

--How will you estimate or find out what each alternative would be like? Is your action plan helpful here, or should it be modified?

--Complete the grid and make at least a tentative choice. Complete last page of workbook and come prepared to discuss your decision next week.

5. Occupational Experience Exercise

--During the period, choose 1 of 20 part-time, work experience program jobs. Leave it unstructured--look for application of some systematic DM procedure, especially the use of a grid.

LESSON PLAN

Class Session (#7) April 18, 1979

Today's class will be a wrap-up session. In addition to summing up and getting closure on the model of career decision making we've been teaching, there are several very important administrative details which must be completed. I think our experience indicates that administrative details should be taken care of first, and the more open-ended activities used as time permits.

Suggested sequencing:

1. Administer the Check List of Decision-Making Ability
2. Explain the nature, vital importance of the Career Decision Simulation. Emphasize : (a) it's fun to use, (b) can be an enjoyable learning experience, and (c) they each will earn $5 by keeping their appointment and spending about 2 hrs. of their time.
   --Remind them that they'll be excused from any classes they miss while using the CDS
   --Make sure each student fills out a "Sign-up Form"
3. Allow each student to discuss his/her "Big" Decision
4. Occupational Experiences Exercise (the 20 part-time jobs) } Optional
5. Class Evaluation Forms
6. Ask Ss to hand-in their DECIDES workbooks. Have them write their names on the first yellow divider page, and if they want to have them back, write "please return" below their names.

APPENDIX E

THE CHECK LIST OF DECISION-MAKING ABILITY (CLDMA)

Name _____
(please print)

CHECK LIST OF DECISION-MAKING ABILITY

You must make decisions every day about what to wear to school, what to eat for lunch, and how to spend free time. But at times you must also make important decisions with more serious consequences, like how you'll spend the summer, what you'll do after graduating, and what kind of career you are interested in.

We want to know how good you think you are at accomplishing various actions that may be a part of making important decisions. On the following eight items, how would you rate your ability as compared with the average person your age?

Poor				Average				Excellent
1	2	3	4	5	6	7	8	9

Write the number representing your ability opposite each question.

____ 1. TO RECOGNIZE WHICH OF YOUR DECISIONS ARE MORE IMPORTANT AND WHICH ARE LESS IMPORTANT?

[For example: How good are you at figuring out which decision has the most important consequences for you: what to have for an afternoon snack, what to do Friday night, what classes to take next semester, or which colleges to apply to?]

____ 2. TO BUDGET TIME FOR MAKING DECISIONS?

[For example: In Example 1, how good are you at planning the amount of time needed to make each of these decisions?]

____ 3. TO SAY WHAT YOUR VALUES ARE?

[For example: Before choosing a new class, how clear are you whether you are taking it for enjoyment, fulfilling requirements or being with your friends?]

____ 4. TO COME UP WITH ALTERNATIVES FOR A DECISION?

[For example: How good are you at coming up with interesting things to do on a weekend?]

____ 5. TO UNDERSTAND THE POSSIBLE OUTCOMES OF VARIOUS ALTERNATIVES?

[For example: If your weekend choices are going camping, visiting a friend in Sacramento, or studying, how well can you state the possible results of each of these choices in advance? For instance, camping may satisfy your love of adventure. Studying will help you get better grades.]

____ 6. TO WEIGH ALTERNATIVES AND ELIMINATE THE LESS DESIRABLE ONES?

[For example: Given the choices in Example 5, how good are you at considering each activity and choosing the best one for you?]

____ 7. TO CARRY OUT A PLAN OF ACTION FOR MAKING YOUR DECISIONS?

[For example: If you have decided to go camping on the weekend, how well can you outline and carry out the steps necessary to accomplish your plan? For instance, can you find a suitable campground, collect the necessary equipment, and organize transportation, as well as set deadlines for each of these steps?]

____ 8. TO RECONSIDER A DECISION WHEN NONE OF THE PRESENT ALTERNATIVES SEEM ACCEPTABLE?

[For example: You have discovered that a class you planned to take has been cancelled. How good are you at rethinking what you wanted from the class and finding some new possibilities?]

APPENDIX F

DIRECTIONS FOR THE CAREER DECISION SIMULATION (CDS)*

Hello. We are pleased that you are willing to participate in this research project. We are trying to learn more about the ways that people make career decisions. Since career decision making is difficult to study in real life we have devised this simulation experience which represents some parts of what it is like to actually make a career decision.

The card boxes and cassettes you see on the table in front of you are information sources which you will be able to use in your career search. In a few minutes I will tell you how to use these materials. But first let me explain your task: Imagine that you are in the process of making a decision about which career to pursue. The career you choose may well be your life's work--so it is an important step. You have a number of possible careers open to you but so far you know nothing about any of them. Information about each of the careers is available, and you may choose to investigate as much or as little of it as you want. The way in which you go about making your decision is entirely up to you.

Now let me explain a few basic procedures. First, notice the tape recorder in front of you. If you should want to stop the tape for a moment or two in order to follow some instructions you may push the stop button. If you have not used a tape recorder before, please ask the administrator to assist you. (pause) I will signal when you should stop the tape by sounding this bell--clang. When you hear that sound, stop the tape, and follow the instructions you have just heard. Then when you are ready to listen again, push the play button. All right, now I would like you to notice the card in front of you labeled Name Card.

---

*Transcript of the audio tape which orients users of the CDS to its purpose, components, rules, and use.

On that card I would like you to fill out the information asked for: name, today's date, your sex, and what time it is now. Clang. Thank you. On the back of the Name Card you will find a black dot. Please put your thumb on that black dot and insert th Name Card into the slot in the Card Return Box. (pause) The Card Return Box is where you will place every card you choose after you have read it. Once you place a card in the Card Return Box you are not permitted to draw it back out or read it again.

The jobs you will be investigating here differ in the values they provide. For example, a particular job may be high on the value of income, moderate on the value of security, and low on the value of variety. Since people differ a great deal in terms of what job values are most important to them, there is no one job which satisfies everyone. If you are unsure about the meaning of the job values feel free to look up any definitions whenever you wish. These definitions are contained in the card box to your left labeled Value Definitions. Remember to place each card you read into the Card Return Box before you take the next card.

If we could make this experience completely true-to-life you would be making your career selection from thousands of jobs. Because this is simply not practical, there are only 12 jobs from which you will be choosing today. These jobs have fictitious names such as Breandist, Tasindic, and Geebist. They represent a variety of types of jobs that you may find in the real world but they are not modeled after any specific jobs that actually exist. How can you find out about the various jobs? Look around you at all the possible sources of information. You will see that you can obtain information from books or magazines, career

handbooks, career speakers, friends, horoscopes, newspaper ads, personal experiences, radio or T.V., or worker interviews. Remember I told you that all the jobs in this game have fictitious names. I'm going to pick one pretty much at random and show you how you can find out about each job. Just to get you started, let's look at the newspaper ads. In the newspaper ads box find the card for Breandist that tells about the income for Breandist. You will find headings across the top of the card that will say "Newspaper Ad - Breandist - Income". Find that card now and read it. Clang. Now make a judgment as to whether you think the income of Breandists is high, medium, or low based on that one bit of information from the newspaper ad. (Long pause) This information source indicates that the income of Breandists is low. Were you able to accurately interpret this one piece of information about Breandists? Each job has real objective values independent of what you think they might be. You will find that some of the information is not perfectly clear--maybe a bit ambiguous, or not totally consistent. This might lead you to make the wrong judgment about whether a given job is high, medium, or low on any particular value. Just as in real life the jobs here have certain set characteristics but the information you get about them may not always be completely clear and obvious. Now be sure you place the Breandist income card in the Card Return Box, as you must return every card there before you pick up your next card. Just hold the card with your thumb on the black dot and push it firmly so that it falls all the way down into the Card Return Box.

Naturally you want to pick a job that gives you most of what you really want in a job. It appears from the information you have seen that the income of a Breandist is low. Does this mean that Breandist

is not a good job choice? It may or may not. Whether or not income affects your ultimate satisfaction with a career depends entirely on what you want from a job. Income may be one of your prime considerations in choosing a career, or it might be of moderate importance, or it might not matter to you at all.

I'm almost ready to let you begin your search--remember, there is no such thing as a "right" or a "wrong" job choice within this simulation. Your goal is simply to find the job that satisfies you most. Approach this task as if it were your real career decision.

You can take as much as an hour and a half to make your decision but you don't have to use that entire time--you may make your decision immediately if you like. Feel free to pick cards from any information source but only one card at a time. Remember to place each card in the Card Return Box before you choose your next card. A pencil and notepad have been provided in case you want to make any notes. Choose as much or as little information as you want. You won't have time to use it all. When you make your decision and write the name of your chosen job down on the Job Decision Card the simulation will be over.

When this tape ends, rewind the tape by pushing the rewind button. Whenever you play other tapes always rewind each one and return it to the place where you found it. Now rewind this tape and enjoy your career search!

APPENDIX G

THE CAREER DECISION SIMULATION (CDS)

Administrator's Manual

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Index

Page

1 . . . . . Introduction

2 . . . . . Checklist of Administrator's Duties (sequential)

4 . . . . . Inventory of CDS Materials

6 . . . . . Diagram of Table Layout for the Career Decision Simulation

7 . . . . . General Introduction Guidelines

8 . . . . . Simulation Rules

9 . . . . . Instructions for Job Rating Form

10 . . . . . Instructions for Personal Work Values Rating Form

11 . . . . . Anticipated Questions and Suggested Answers

12 . . . . . CDS Appointment Form

13 . . . . . CDS Appointment Reminder Form

14 . . . . . Job Choice Form

15 . . . . . Diagram of Job Rating Form

16 . . . . . Diagram of Personal Work Values Rating Form

17 . . . . . Personal Work Values (Paper and Pencil Rating Form)

18 . . . . . Job Decision Card (with "Start Here" and Name Card)

19 . . . . . Explanation of CDS Scores

- Accuracy
- Values Congruence: Times 1 & 2
  - Scoring System for Computing Raw Scores
  - Rank Orders Transformed from Raw Scores
- Thoroughness
- Confidence

Introduction

You are about to perform a crucial task as part of a research project that is designed to assess how well people make career-related decisions. Your job as Administrator for the Career Decision Simulation (CDS) exercise requires careful preparation and attention to details, since the CDS is our primary measure of career decision-making effectiveness.

Each subject's score on the CDS will be compared to the scores of a large number of other subjects. Thus, it is essential that each administration be done as uniformly as possible. This means setting up the materials in the same arrangement each time, making sure none of the simulation rules are violated, answering any questions consistently and only as specified in this Manual, and keeping track of the 90-minute time limit.

Your job will be a busy one. You must be sure that each subject follows all of the simulation rules. Since you may be responsibile for administering the CDS to two subjects at any given time, your familiarity with the CDS rules and set-up is essential.

Remember, we are interested in discovering the procedures used by people to make career decisions. One of the most important means we have for uncovering these procedures is to record the order in which people use pieces of information. Therefore, it is very important to keep all of the cards used by each subject in the exact sequence in which they were placed into the Card Return Box.

Finally, it is suggested that each Administrator spend at least 90 minutes playing the CDS before administering it to any subjects. This gives one a good appreciation of how it feels and looks from the subject's point of view and is really the best way to learn what the CDS is all about.

Checklist of Administrator's Duties

- Before Subject(s) Enters -

1) Check physical set-up: e.g., screen between S's (if available), chair for each S and Administrator, two 3' x 6' tables (with S's back-to-back) small table for cassette holders, etc.

2) Check simulation materials against the inventory listed on pages 5 and 6.

3) Set up materials according to diagram.

4) Check cassette player for proper functioning and volume level; also check headsets.

5) Put new card deck(s) into boxes.

6) Check to make sure there is sufficient light.

- With Subject -

1) Go over Introduction Guidelines

2) Be sure S places "Name Card" in Card Return box properly.

3) Be prepared to show S how to use cassette player.

4) Make sure S follows all games rules.

5) Watch the clock to make sure 90 minute time limit observed (time from end of instruction tape to completion of the "Job Decision" card); inform S when only 15 minutes are left.

6) Make sure S fills out the "Job Decision" card.

7) Once S has filled out a Job Decision card, present S with Job Rating Form and appropriate instructions.

8) Remove Job Rating Form and present S with Personal Work Values Rating

Form and appropriate instructions.

- After S has completed the Job and Personal Work Value Rating Forms -

1) Thank Subject.

2) Explain that the exercise is over.

3) Answer S's questions.

4) Pay S and have S sign receipt list.

5) Fill out Job Choice Form - Very important to be accurate here.

6) Pull deck of cards from Card Return Box. Put rubber band around entire deck placing S's Name Card on top; make sure exact sequence of cards is retained, especially when placing the Name Card on top of the deck.

7) Retain S's notes and label them with S's name and today's date. Attach to "Job Choice" Form.

- Setting Up For Next S -

1) Pull unused cards from all boxes, rubber band, and label with S's name and today's date.

2) Return pegs to boxes and replace Personal Work Values and Job Rating Forms. (These objects should be removed from view of next subject).

3) Recycle through the Checklist of Administrator's Duties in preparation for the next S to use that table and CDS.

Inventory of Career Decision Simulation (CDS) Materials

-1 Personal Work Values Rating Form

-1 Job Rating Form

-111 Blue High ("H") Pegs

-111 Red Medium ("M") Pegs

-111 Yellow Low ("L") Pegs

-3 Plastic Peg Boxes (1 blue, 1 yellow, 1 red)

-9 Job Information Card Boxes

- Book or Magazine
- Career Handbook
- Career Speaker
- A Friend
- Horoscope
- Newspaper Ad
- Personal Experience
- Radio or TV
- Worker Interview

Each containing:
- 12 index tabs = 12 fictitious jobs arranged alphabetically (Breandist - Zampic)
- 36 3x5 cards/box; 3 cards/job

-1 Value Definition Card Box (containing 9 cards)

-1 Card Return Box

-109 Cassettes: 1 labeled "Directions"; the others labeled Tape #1 - Tape #108

-2 Cassette holders:

-1 holds 72 cassettes (large): Tapes #1 - #60 (and "Directions" tape)

-1 holds 48 cassettes (small): Tapes #61 - #108

Inventory of CDS Materials (Contd)

-1 Cassette player

-1 Set of headphones

-1 "Start Here" card

-1 "Name" card

-1 "Job Decision" card

- Pencils for S and Administrator

- Notepad

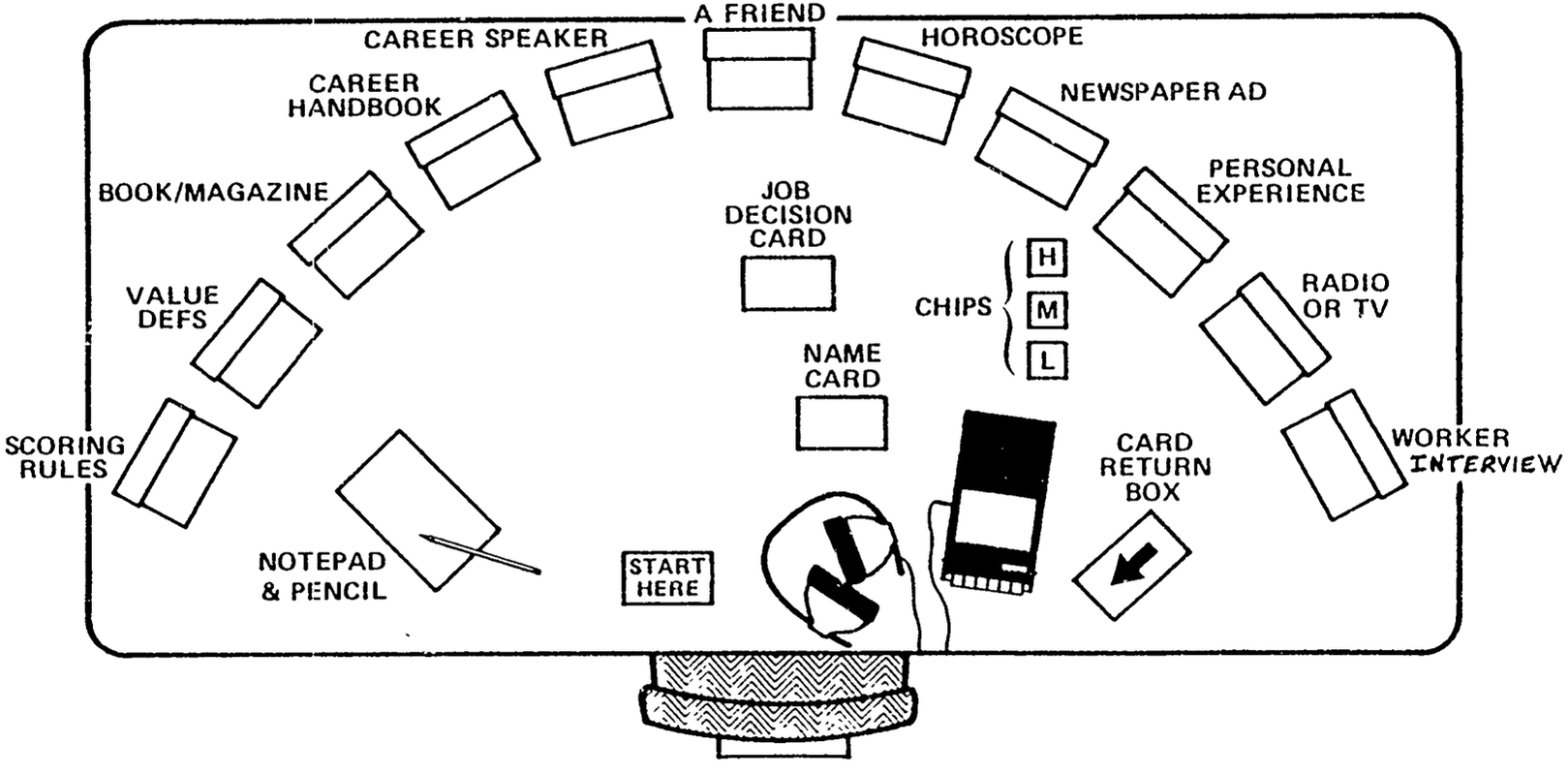
- Some kind of timepiece

- Supply of rubber bands

- Index cards for Administrator to label stack of unused cards

-1 Administrator's Manual (with Job Choice forms)

TABLE LAYOUT FOR CAREER DECISION SIMULATION



General Introduction Guidelines

Hello, I'm. . . .

Please be seated. We're happy that you're able to help us out with this research.

First, let me tell you something about what we're trying to do. Our main purpose is to learn more about the ways that people make decisions about the jobs and careers they select.

Since decisions are difficult to observe in real life, we're attempting to use a simulation model to get some information. That is what all of these things on the table are for.

We don't have any tricks up our sleeve, and there are no surprise endings. This is not a test. We're merely interested in the way in which you go about making your decisions and coming to your eventual conclusion. We'll study that by looking at which cards you use and the order in which you use them.

I'll be the "administrator" for this exercise. My role is to make sure you follow several rules and to answer your questions.

Very shortly you'll be hearing specific instructions on exactly what to do. To begin, I want you to read the "Start Here" card in front of you on the table.

Simulation Rules

1) S must read "Start Here" card, fill out "Name" card, listen to and follow DIRECTIONS tape, and fill out final "Job Decision" card.

2) S must place each card in the Card Return Box (by placing thumb on dot) prior to selecting or reading any other card. Thus, only one card may be read at any given time.

3) S must read any card picked before placing it in the Card Return Box.

4) Ss may survey or "flip through" the label sides (front) of cards as much as they wish, as long as they do not read the information (back) sides of cards.

5) S is not permitted to open the Card Return Box.

6) S may move card boxes for easier access if desired.

7) S must rewind and return all tapes used to the Cassette Holder.

8) S may wear earphones throughout the session.

9) Ss must make their job decisions within 90 minutes after completing the "Directions" tape.

10) Ss must rate their final job choice on each of its 9 value-characteristics after filling out the "Job Decision" card. There is no restriction on the number of H, M, or L pegs used to make this judgment on the Job Rating Form.

11) S must assign 3 H, 3 M, and 3 L Pegs on the Personal Work Values Rating Form after completing the value ratings on the Job Rating Form. (The Job Rating Form must be out of S's view at this time.)

Instructions to be presented with the Job Rating Form

After Ss have filled out the Job Decision card, present Ss with the Job Rating Form , rating pegs, and say:

You've done some research today on _____(S's final job choice). Based on the information you've gathered, how would you rate each of the characteristics or values of this job? These colored pegs are marked either H for high, M for medium, or L for low. Please indicate whether _____ rates high, medium, or low on each of the job values listed here. Don't worry if you are uncertain or if you don't know exactly how _____ would rate on a particular value. Simply make the closest judgment you can based on the information you used here today.

Instructions to be presented with "Personal Work Values Rating Form"

After the Ss have rated the 9 characteristics of their final job choice, and the Job Rating Form has been removed from their view, present Ss with the Personal Work Values Rating Form and say:

It's usually not possible to find a job which has exactly what you want. This is especially true when there are as few as 12 jobs to choose from. What we'd like you to consider now is your "ideal" job. What characteristics would a job that was tailor-made for you have?

To help you think about this, I'll give you a rating form similar to the one you just used to rate the make-believe job you picked. Follow the instructions at the top of the form. Remember, although we want you to make your ratings for an ideal job, there is the requirement that 3 of the work values be rated high, 3 medium, and 3 low. Once again, colored pegs marked "H" for high, "M" for medium, and "L" for low are provided to make your ratings.

Anticipated Questions and Suggested Answers

Try to make a distinction between procedural questions and substantive questions which ask for advice on how to actually make decisions in which we are interested. You may answer procedural questions such as:

- Q: Can I move these boxes around?
  A: Yes.

- Q: What do I do now? (immediately after DIRECTIONS tape).
  A: You should begin picking and reading any of the cards, one at a time, in any order you wish.

- Q: Can I pull any cards I want?
  A: Yes, but you must read any card you pull and place it in the Card Return Box before selecting another one.

- Q: What's the note pad for?
  A: You may use this pad for recording information and making any notes that seem helpful.

- Q: What happens if I don't finish in time?
  A: If you haven't selected a job at the end of 90 minutes, you will be required to choose one at this time.

Remember, such questions should be answered as explicitly and succinctly as possible.

You may not answer substantive questions such as:

1) How much time should I take on each card? (B)
2) Which boxes should I use? (B)
3) What's a Career Handbook? (A)
4) Should I take my time? (B)
5) Should I rate this value for Splacker high? (B)

The administrator cannot directly answer these questions. Subjects should be given these two answers: (A) "You can find the answer to that question by using the materials in front of you." (B) "That's your decision."

Answer all "Is it better..." questions with response (B).

THE CAREER DECISION SIMULATION

APPOINTMENT FORM

Your name (please print): _____

Phone number(s) where we can reach you: _____

What would be the best 2 hour time period for you to use the Career Decision Simulation? Remember, you will be excused for any class time you miss, but try to pick a time when you'll be missing no more than one class period.

Indicate your 1st, 2nd, and 3rd choices by placing a 1, 2, or 3 after three of the time periods listed below:

8:00--10:00 A.M. _____

10:30 A.M.--12:30 P.M. _____

1:00--3:00 P.M. _____

3:20--5:20 P.M. _____

You will be assigned one of these periods and given a card telling you of the date, time period, and room number for your appointment. It is very important that you be there on time! Please indicate here if there are any days of the week (Monday through Friday) when you would not be able to keep your appointment for one of the 3 times you indicated above.

CDS APPOINTMENT REMINDER FORM

....., you have an appointment to use the Career Decision Simulation on.....at..... in.....

Please be prompt. If for some reason you are unable to keep this appointment, call Mr. Hamel at 327-1989 as soon as possible.

JOB CHOICE FORM

Subject _____ Date _____

Administrator _____ Ended _____

Job Choice _____ Began _____

	Job Values Ratings (H,M, or L)	Personal Work Values Ratings (H,M, or L)
Early Entry	_____	_____
Helping Others	_____	_____
Income	_____	_____
Independence	_____	_____
Leadership	_____	_____
Leisure	_____	_____
Prestige	_____	_____
Security	_____	_____
Variety	_____	_____

Administrator's Comments:

JOB RATING FORM

Based on the information you've used, how would you rate the occupation of

VALUES	RATING
EARLY ENTRY	
HELPING OTHERS	
INCOME	
INDEPENDENCE	
LEADERSHIP	
LEISURE	
PRESTIGE	
SECURITY	
VARIETY	

PERSONAL WORK VALUES RATING FORM

In choosing a career, how important to you is each of these values? Rate 3 values high (H), 3 values medium (M), and 3 low (L).

VALUES	RATING
EARLY ENTRY	
HELPING OTHERS	
INCOME	
INDEPENDENCE	
LEADERSHIP	
LEISURE	
PRESTIGE	
SECURITY	
VARIETY	

Name: _____

PERSONAL WORK VALUES

In choosing a career, how important to you is each of these values? Rate 3 values high (H), 3 values medium (M), and 3 values low (L).

VALUES	RATING
Early entry	_____
Helping Others	_____
Income	_____
Independence	_____
Leadership	_____
Leisure	_____
Prestige	_____
Security	_____
Variety	_____

START HERE

You are about to make a major career decision--but only as part of a simulation exercise. You will find the process both educational and fun.

You are to pretend that you want to decide on your life's work, or at least the job you want to try next. Try to approach this task in the way you would really decide on a career.

This simulation exercise is self-explanatory. Your next step is to find the cassette tape labeled "Directions" above Tape 1 in the Cassette Tape Holder. Insert this tape in the tape player, push the "Play" button and follow the directions you will hear.

NAME CARD

(Please Print)

LAST NAME ☐☐☐☐☐☐☐☐☐☐☐

FIRST NAME ☐☐☐☐☐☐☐☐☐

TODAY'S DATE ☐☐☐ ☐☐ 19? ☐
(Month) (Day) (Year)

YOUR SEX (M or F) ☐

ENTER EXACT TIME NOW ☐☐ : ☐☐ A.M. ☐ P.M. ☐

Job Decision Card

Job Name _____

Enter exact time now ☐☐ : ☐☐ A.M. ☐ P.M. ☐

How confident are you that you made the best possible job choice? (Circle a number)

0	1	2	3	4	5	6	7	8	9	10
not confident at all					moderately confident					very confident

Explanation of CDS Scores

Accuracy Score

The "accuracy" score is simply a measure of how accurately the subject rates each of the nine work values for the chosen occupation. Presumably, these ratings reflect: (1) the amount and kind of information accessed; (2) one's ability to interpret the information's intended meaning correctly; and (3) one's ability to recall those interpreted meanings while rating the chosen occupation as being high, medium or low on each of the nine work values.

Given the task of rating nine work values as either high (3), medium (2), or low(1), 15 is the maximum number of "increments" one could err by in rating an occupation since all 12 occupations were randomly assigned three high, three medium, and three low values. In order to create transformed scores with a midpoint near 50, the following CDS "accuracy" score key was used:

CDS "Accuracy" Score Key

Total Number of Increments off	Equivalent (transformed) Raw Score
0	85
1	80
2	75
3	70
4	65
5	60
6	55
7	50
8	45
9	40
10	35
11	30
12	25
13	20
14	15
15	10

Range = 10-85 Theoretical Mean = 47.5 Obtained Mean = 61.7

Values Congruence Scores

The values congruence scores are based on the "degree of fit" between the assigned work value levels of the chosen occupation and forced choice work value ratings reported at two different times. The rationale for this criterion is that good decision makers choose alternatives consistent with their expressed value preferences. A "Time 1" paper and pencil values rating rask (see page 17 of this manual) is administered about one month before subjects use the CDS. The "Time 2" rating task (see page 16 of this manual) is administered immediately after a subject chooses a CDS occupation, and is identical in nature except for the use of a wooden form and pegs instead of paper and a pencil. Thus, two different values congruence scores can be generated for each subject, allowing inferences about the stability of values preferences and the influence of a recent choice on value preferences.

Raw values congruence scores are computed according to the following scoring system which awards points based on the closeness of match, with high value matches being worth more than mediums, and mediums correspondingly more than lows.

Each of the nine ratings on the Personal Work Values Rating Form is compared with the "real" level (high, medium, or low) of the job chosen, by the subject.

Number of Points Each of Your Values Will Earn

If your personal work value is	When the real level of your Career Decision on that value is		
	High (H)	Medium (M)	Low(L)
High (H)	60	20	0
Medium (M)	30	40	5
Low (L)	10	15	20

Here, for example, is how a given person's score would be determined.

Values	Suppose Ms. X had made these ratings	Suppose Ms X had chosen the job of "Lawender" which had these real levels on each value	She would then receive these points
Early Entry	H	H	60
Helping Others	M	L	5
Income	L	H	10
Independence	H	M	20
Leadership	L	M	15
Leisure	M	M	40
Prestige	M	H	30
Security	L	L	20
Variety	H	L	0
		Total	200

A computer-assisted calculation of the CDS scoring key for values congruence scores resulted in a computer printout on 95 8½" x 11" pages (see example on following page). This key provides a handy way for the administrator to quickly determine a subject's values congruence scores on the CDS. It is systematically arranged to display the 1,680 different ways a subject can assign three high, three medium, and three low values from a set of nine different work values. For each of these 1,680 possible value level configurations, a raw score based on the CDS's scoring system is provided for all 12 of the fictitious occupations from which subjects must choose. Thus, a subject's scores can be looked up in the printout simply by knowing the ratings on the Personal Work Values Rating Forms and the name of the occupation written on the Job Decision card (see page 18 of this manual).

Notice that the printout also provides standard scores for each raw score calculated. These standard scores were not used because an error was made in their computation. Also, it was concluded that a

112/223/313			112/223/331			112/231/233			112/231/323			112/231/332			112/232/133		
LLH/HHH/HLH			LLH/HHH/HHL			LLH/HHL/HHH			LLH/HHL/HHH			LLH/HHL/HHH			LLH/HHH/LHH		
JEPIST	245	70	ZAMPIC	285	70	TASINDIC	285	70	HISTER	250	70	TASINDIC	270	70	PLINDER	285	70
HISTER	235	65	PLINDER	235	57	PLINDER	245	60	BREANDIST	245	60	QUENTIC	250	64	TASINDIC	245	60
BREANDIST	230	63	QUENTIC	235	57	ONICIAN	240	59	ONICIAN	240	67	PLINDER	245	63	ZAMPIC	235	57
DEPTICIAN	230	63	TASINDIC	235	57	SPLACKER	205	51	TASINDIC	235	65	ONICIAN	225	57	HISTER	205	50
ZAMPIC	215	56	HISTER	190	45	DEPTICIAN	200	50	PLINDER	210	50	GEEBIST	205	52	QUENTIC	205	50
GEEBIST	205	52	ONICIAN	190	45	HISTER	200	50	DEPTICIAN	200	55	SPLACKER	205	52	BREANDIST	200	49
KRALICIAN	200	50	BREANDIST	185	41	QUENTIC	200	50	QUENTIC	200	55	HISTER	200	50	ONICIAN	200	49
QUENTIC	190	45	DEPTICIAN	185	44	ZAMPIC	200	47	GEEBIST	190	52	ZAMPIC	200	50	DEPTICIAN	195	48
ONICIAN	165	34	GEEBIST	[illegible]	42	BREANDIST	195	48	SPLACKER	190	52	BREANDIST	195	49	JEPIST	195	48
PLINDER	165	34	JEPIST	[illegible]	41	JEPIST	140	40	ZAMPIC	165	44	DEPTICIAN	150	36	SPLACKER	165	40
TASINDIC	165	34	KRALICIAN	[illegible]	41	GEEBIST	155	39	JEPIST	140	43	KRALICIAN	130	31	KRALICIAN	150	37
SPLACKER	155	30	SPLACKER	[illegible]	[illegible]	KRALICIAN	115	30	KRALICIAN	115	30	JEPIST	125	30	GEEBIST	120	30

112/232/313			112/232/331			112/233/123			112/233/132			112/233/213			112/233/231		
LLH/HHH/HLH			LLH/HHH/HHL			LLH/HHH/LHH			LLH/HHH/LHH			LLH/HHH/HLH			LLH/HHH/HHL		
HISTER	250	70	PLINDER	285	70	DEPTICIAN	245	70	PLINDER	270	70	DEPTICIAN	245	70	TASINDIC	285	70
BREANDIST	245	60	TASINDIC	270	[illegible]	PLINDER	235	66	ZAMPIC	270	70	JEPIST	230	63	PLINDER	270	66
PLINDER	215	56	QUENTIC	250		ZAMPIC	235	66	TASINDIC	245	62	ONICIAN	215	56	ZAMPIC	270	66
QUENTIC	205	52	ZAMPIC	235	[illegible]	JEPIST	230	65	QUENTIC	205	50	TASINDIC	215	56	ONICIAN	240	59
ONICIAN	200	50	ONICIAN	220	[illegible]	ONICIAN	215	60	KRALICIAN	200	49	SPLACKER	205	52	DEPTICIAN	200	48
TASINDIC	200	50	HISTER	205	[illegible]	TASINDIC	210	58	ONICIAN	200	49	HISTER	200	50	QUENTIC	200	48
DEPTICIAN	195	48	BREANDIST	200		HISTER	205	57	DEPTICIAN	195	47	PLINDER	200	50	SPLACKER	180	42
JEPIST	195	48	GEEBIST	190	43	BREANDIST	200	55	JEPIST	195	47	ZAMPIC	200	50	JEPIST	160	37
GEEBIST	190	46	SPLACKER	[illegible]	[illegible]	KRALICIAN	185	50	SPLACKER	180	43	BREANDIST	195	47	KRALICIAN	160	37
SPLACKER	190	46	DEPTICIAN	170	[illegible]	SPLACKER	165	44	HISTER	155	35	KRALICIAN	165	43	HISTER	155	36
ZAMPIC	165	36	JEPIST	125	[illegible]	QUENTIC	155	41	BREANDIST	150	34	GEEBIST	155	30	BREANDIST	150	35
KRALICIAN	150	30	KRALICIAN	125	[illegible]	GEEBIST	120	30	GEEBIST	135	30	QUENTIC	155	30	GEEBIST	130	30

112/233/312			112/233/321			112/312/233			112/312/323			112/312/332			112/313/223		
LLH/HHH/HLH			LLH/HHH/HHL			LLH/HLH/HHH			LLH/HLH/HHH			LLH/HLH/HHH			LLH/HLH/HHH		
GEEBIST	205	70	ONICIAN	240	70	BREANDIST	270	70	BREANDIST	320	70	QUENTIC	275	70	DEPTICIAN	320	70
QUENTIC	205	70	PLINDER	235	67	DEPTICIAN	270	70	HISTER	275	61	BREANDIST	270	68	BREANDIST	270	59
SPLACKER	205	70	TASINDIC	235	67	TASINDIC	250	64	DEPTICIAN	270	60	TASINDIC	235	58	HISTER	225	50
HISTER	200	50	ZAMPIC	225	67	HISTER	225	57	QUENTIC	225	51	HISTER	225	55	ONICIAN	220	43
KRALICIAN	200	50	HISTER	205	52	QUENTIC	225	57	ONICIAN	205	47	DEPTICIAN	220	54	TASINDIC	215	47
ONICIAN	200	50	BREANDIST	200	50	ONICIAN	205	52	TASINDIC	200	46	PLINDER	200	48	JEPIST	205	45
PLINDER	200	50	DEPTICIAN	200	50	PLINDER	200	50	JEPIST	170	40	ZAMPIC	195	47	ZAMPIC	195	43
TASINDIC	200	50	QUENTIC	200	[illegible]	ZAMPIC	195	49	GEEBIST	165	39	ONICIAN	190	45	QUENTIC	175	39
ZAMPIC	200	50	GEEBIST	165	32	JEPIST	170	42	PLINDER	165	39	GEEBIST	180	42	KRALICIAN	160	36
BREANDIST	195	30	SPLACKER	165	[illegible]	SPLACKER	135	32	ZAMPIC	160	38	KRALICIAN	140	31	PLINDER	150	34
DEPTICIAN	195	30	JEPIST	140	[illegible]	GEEBIST	130	31	KRALICIAN	125	31	JEPIST	135	30	SPLACKER	135	31
JEPIST	195	30	KRALICIAN	[illegible]	[illegible]	KRALICIAN	125	30	SPLACKER	120	30	SPLACKER	135	30	GEEBIST	130	30

rank-order "goodness of choice" would better reflect the conceptualization of the values congruence scores. Therefore, raw scores are simply transformed to create rank-order scores. These "rank order of goodness" scores reflect how close subjects come to choosing the occupation most similar to their value preferences (a rank of 12 = best possible choice and a rank of 1 = worst possible choice among the 12 available alternatives).

Thoroughness Score

The "thoroughness of information search on highest values" score is based on the assumption that one should spend the greatest amount of time and effort gathering information about those aspects (work values) of a job setting one rates as being most important. A forced values rating task administered immediately after subjects choose an occupation requires them to rate three values as being most important to them (see page 16 of this manual). The thoroughness score reflects what percentage of all information units used during a CDS performance relates to those three most important values.

Confidence Score

The confidence score is based on subjects' judgments as to how likely their chosen occupation represents the best one for them among the 12 available. They rate their confidence on a 1-10 scale (10 = very confident) immediately after choosing an occupation (see the Job Decision Card on page 18 of this manual).

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194

APPENDIX H

CHECK LIST OF DECISION-MAKING ABILITY (CLDMA)
PRE- AND POSTTREATMENT FACTOR LEVEL MEANS
FOR ITEMS 1-8

Table H-1

Means and Standard Deviations for Pretreatment
CLDMA Item 1 (Define the Problem) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
1	Experimental	8	5 50	1.73	7.25	0.96	6.38	1.60
	Control	8	6.00	1.63	8.00	0.0	7.00	1.51
2	Experimental	8	6.00	1.83	7.00	1.63	6.50	1.69
	Control	8	6.25	1.50	4.50	1.73	5.38	1.77
3	Experimental	5	8.00	0.0	7.33	0.58	7.60	0.55
	Control	8	6.80	1.30	6.67	1.15	6.75	1.17
4	Experimental	8	7.00	0.82	7.50	0.58	7.25	0.71
	Control	8	6.25	0.96	7.25	1.71	6.75	1.39
Totals	Experimental	29	6.43	1.55	7.27	0.96	6.86	1.33
	Control	32	6.35	1.27	6.60	1.84	6.47	1.55

Table H-2

Means and Standard Deviations for Pretreatment
CLDMA Item 2 (Establish an Action Plan) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	4.50	1.29	7.25	0.96	5.88	1.81
	Control	8	4.50	1.29	7.25	2.22	5.88	2.23
#2	Experimental	8	3.75	1.26	5.25	2.06	4.50	1.77
	Control	8	6.25	1.50	5.75	2.06	6.00	1.69
#3	Experimental	5	5.50	0.71	5.00	0.0	5.20	0.45
	Control	8	4.60	2.51	5.00	0.0	4.75	1.91
#4	Experimental	8	5.75	1.50	6.25	0.96	6.00	1.20
	Control	8	6.00	1.83	7.50	1.29	6.75	1.67
Totals	Experimental	29	4.79	1.42	6.00	1.46	5.41	1.55
	Control	32	5.29	1.90	6.47	1.85	5.84	1.94

Table H-3

Means and Standard Deviations for Pretreatment CLDMA
Item 3 (Clarify Values) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	5.25	2.63	7.75	1.50	6.50	2.39
	Control	8	6.50	1.00	8.00	1.41	7.25	1.39
#2	Experimental	8	6.50	2.38	8.00	1.15	7.25	1.91
	Control	8	7.25	0.96	4.75	1.71	6.00	1.85
#3	Experimental	5	7.00	0.0	6.00	1.00	6.40	0.89
	Control	8	7.20	1.48	5.00	1.00	6.38	1.69
#4	Experimental	8	7.00	0.82	7.75	0.96	7.38	0.92
	Control	8	7.00	1.63	8.00	2.00	7.50	1.77
Totals	Experimental	29	6.36	1.91	7.47	1.30	6.93	1.69
	Control	32	7.00	1.22	6.53	2.17	6.78	1.72

Table H-4

Means and Standard Deviations for Pretreatment CLDMA
Item 4 (Identify Alternatives) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	4.00	2.45	6.75	2.63	5.38	2.77
	Control	8	4.75	0.50	4.50	1.91	4.63	1.30
#2	Experimental	8	5.75	0.96	6.25	1.26	6.00	1.07
	Control	8	5.75	1.50	5.50	2.65	5.63	2.00
#3	Experimental	5	5.00	0.0	6.00	0.0	5.60	0.55
	Control	8	5.60	3.05	6.33	1.53	5.88	2.47
#4	Experimental	8	8.00	0.82	7.00	0.82	7.50	0.93
	Control	8	6.75	2.06	7.50	1.73	7.13	1.81
Totals	Experimental	29	5.79	2.08	6.53	1.46	6.17	1.79
	Control	32	5.71	2.02	5.93	2.15	5.81	2.05

Table H-5

Means and Standard Deviations for Pretreatment CLDMA
Item 5 (Discover Probable Outcomes) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	5.25	1.71	6.25	0.96	5.75	1.39
	Control	8	6.25	0.96	7.25	1.50	6.75	1.28
#2	Experimental	8	5.50	1.29	7.25	0.96	6.38	1.41
	Control	8	6.75	0.96	5.50	1.29	6.13	1.25
#3	Experimental	5	5.50	0.71	6.00	0.0	5.80	0.45
	Control	8	5.60	1.82	5.67	1.15	5.63	1.51
#4	Experimental	8	7.00	0.82	6.50	2.38	6.75	1.67
	Control	8	7.00	1.63	7.50	1.73	7.25	1.58
Totals	Experimental	29	5.86	1.35	6.53	1.36	6.21	1.37
	Control	32	6.35	1.41	6.53	1.60	6.44	1.48

Table H-6

Means and Standard Deviations for Pretreatment CLDMA Item 6
(Eliminate Alternatives Systematically) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	5.00	2.45	6.75	2.06	5.88	2.30
	Control	8	6.25	1.50	7.00	2.16	6.63	1.77
#2	Experimental	8	5.75	1.89	7.50	0.58	6.63	1.60
	Control	8	7.50	0.58	5.25	2.06	6.38	1.85
#3	Experimental	5	6.50	2.12	6.00	1.00	6.20	1.30
	Control	8	5.80	2.17	6.33	0.58	6.00	1.69
#4	Experimental	8	7.25	0.96	7.00	1.83	7.13	1.36
	Control	8	7.00	1.63	7.25	2.22	7.13	1.81
Totals	Experimental	29	6.07	1.90	6.87	1.46	6.48	1.70
	Control	32	6.59	1.62	6.47	1.92	6.53	1.74

Table H-7

Means and Standard Deviations for Pretreatment CLDMA
Item 7 (Start Action) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	4.50	1.73	7.00	0.82	5.75	1.83
	Control	8	5.25	0.96	8.00	0.82	6.63	1.69
#2	Experimental	8	7.00	2.45	6.75	1.71	6.88	1.96
	Control	8	8.00	0.82	5.25	1.89	6.63	2.00
#3	Experimental	5	7.50	0.71	7.00	1.00	7.20	0.84
	Control	8	7.00	2.00	6.00	1.00	6.63	1.69
#4	Experimental	8	5.75	1.50	8.00	0.0	6.88	1.55
	Control	8	5.75	2.22	9.00	0.0	7.38	2.26
Totals	Experimental	29	6.00	2.00	7.20	1.08	6.62	1.68
	Control	32	6.53	1.84	7.13	1.88	6.81	1.86

Table H-8

Means and Standard Deviations for Pretreatment CLDMA
Item 8 (Recycle If Necessary) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	5.50	1.91	7.50	1.29	6.50	1.85
	Control	8	6.50	1.29	7.25	1.71	6.88	1.46
#2	Experimental	8	5.25	2.88	6.25	1.50	5.75	2.19
	Control	8	7.25	1.26	4.25	1.71	5.75	2.12
#3	Experimental	5	8.00	0.0	6.33	0.58	7.00	1.00
	Control	8	6.20	1.64	5.33	0.58	5.88	1.36
#4	Experimental	8	7.75	1.26	7.25	1.50	7.50	1.31
	Control	8	6.50	1.29	8.50	0.58	7.50	1.41
Totals	Experimental	29	6.43	2.17	6.87	1.33	6.66	1.76
	Control	32	6.87	1.30	6.40	2.10	6.50	1.70

Table H-9

Means and Standard Deviations for Posttreatment CLDMA
Item 1 (Define the Problem) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	6.25	1.26	8.25	0.50	7.25	1.39
	Control	8	6.25	0.96	7.75	0.50	7.00	1.07
#2	Experimental	8	7.50	0.58	7.00	1.41	7.25	1.04
	Control	8	7.25	1.50	7.00	0.82	7.13	1.13
#3	Experimental	5	7.00	1.41	7.67	0.58	7.40	0.89
	Control	8	7.20	1.10	4.67	0.58	6.25	1.58
#4	Experimental	8	8.00	0.82	8.00	0.82	8.00	0.76
	Control	8	8.00	0.82	7.75	1.89	7.88	1.36
Totals	Experimental	29	7.21	1.12	7.73	0.96	7.48	1.06
	Control	32	7.18	1.19	6.93	1.58	7.06	1.37

Table H-10

Means and Standard Deviations for Posttreatment CLDMA Item 2
(Establish an Action Plan) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	6.00	1.41	7.00	0.0	6.50	1.07
	Control	8	4.75	2.06	5.25	2.22	5.00	2.00
#2	Experimental	8	5.25	0.96	5.25	2.87	5.25	1.98
	Control	8	6.25	0.96	7.25	2.36	6.75	1.75
#3	Experimental	5	6.00	0.0	6.33	1.15	6.20	0.84
	Control	8	6.00	2.0	5.33	1.53	5.75	1.75
#4	Experimental	8	6.75	2.50	6.00	1.41	6.38	1.92
	Control	8	7.25	0.96	6.50	1.73	6.88	1.36
Totals	Experimental	29	6.00	1.57	6.13	1.68	6.07	1.60
	Control	32	6.06	1.71	6.13	2.00	6.09	1.82

Table H-11

Means and Standard Deviations for Posttreatment CLDMA
Item 3 (Clarify Values) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	6.50	2.08	6.50	1.91	6.50	1.85
	Control	8	6.50	1.73	7.75	0.96	7.13	1.46
#2	Experimental	8	8.00	1.41	7.50	1.29	7.75	1.28
	Control	8	7.25	6.50	4.75	1.71	6.00	1.77
#3	Experimental	5	8.00	1.41	7.67	0.58	7.80	0.84
	Control	8	7.20	2.05	6.33	1.53	6.88	1.81
#4	Experimental	8	8.00	1.41	8.00	0.0	8.00	0.93
	Control	8	8.00	0.82	8.75	0.50	8.38	0.74
Totals	Experimental	29	7.57	1.60	7.40	1.24	7.48	1.40
	Control	32	7.24	1.44	6.93	1.94	7.09	1.67

Table H-12

Means and Standard Deviations for Posttreatment CLDMA
Item 4 (Identify Alternatives) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	6.25	2.22	4.50	2.08	5.38	2.20
	Control	8	4.50	1.73	4.75	0.50	4.63	1.19
#2	Experimental	8	6.75	2.06	6.75	1.71	6.75	1.75
	Control	8	7.75	1.26	6.00	1.83	6.88	1.73
#3	Experimental	5	6.50	0.71	7.67	0.58	7.20	0.84
	Control	8	7.40	1.82	4.67	1.53	6.38	2.13
#4	Experimental	8	6.75	1.26	8.00	1.41	7.38	1.41
	Control	8	7.00	2.45	7.75	1.26	7.38	1.85
Totals	Experimental	29	6.57	1.60	6.67	2.02	6.62	1.80
	Control	32	6.71	2.11	5.87	1.77	6.31	1.97

Table H-13

Means and Standard Deviations for Posttreatment CLDMA Item 5 (Discover Probable Outcomes) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	4.75	2.99	6.25	0.50	5.50	2.14
	Control	8	5.50	2.38	6.75	1.50	6.13	1.96
#2	Experimental	8	7.50	1.73	7.25	0.96	7.38	1.30
	Control	8	8.00	0.82	7.00	1.63	7.50	1.31
#3	Experimental	5	6.00	2.83	7.33	0.58	6.80	1.64
	Control	8	5.80	1.92	5.33	0.58	5.63	1.51
#4	Experimental	8	7.25	0.96	7.75	0.50	7.50	0.76
	Control	8	7.75	0.96	8.00	0.82	7.88	0.83
Totals	Experimental	29	6.43	2.24	7.13	0.83	6.79	1.68
	Control	32	6.71	1.90	6.87	1.46	6.78	1.68

Table H-14

Means and Standard Deviations for Posttreatment CLDMA Item 6
(Eliminate Alternatives Systematically) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	6.00	1.41	6.50	1.29	6.25	1.28
	Control	8	6.25	1.26	7.00	0.82	6.63	1.06
#2	Experimental	8	7.75	0.96	7.00	1.41	7.38	1.19
	Control	8	6.75	1.50	7.00	1.41	6.88	1.36
#3	Experimental	5	7.00	1.41	7.67	0.58	7.40	0.89
	Control	8	8.00	0.71	6.00	1.00	7.25	1.28
#4	Experimental	8	7.25	1.50	7.25	0.96	7.25	1.17
	Control	8	7.00	1.63	8.00	1.41	7.50	1.51
Totals	Experimental	29	7.00	1.36	7.07	1.10	7.03	1.21
	Control	32	7.06	1.34	7.07	1.28	7.06	1.29

Table H-15

Means and Standard Deviations for Posttreatment CLDMA
Item 7 (Start Action) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	6.50	1.91	6.50	1.00	6.50	1.41
	Control	8	6.75	0.96	7.00	1.41	6.88	1.13
#2	Experimental	8	7.50	1.29	6.00	1.83	6.75	1.67
	Control	8	7.00	1.41	5.75	1.26	6.38	1.41
#3	Experimental	5	7.00	0.0	8.00	1.00	7.60	0.89
	Control	8	6.60	1.82	5.00	1.00	6.00	1.69
#4	Experimental	8	6.75	1.89	7.75	0.96	7.25	1.49
	Control	8	8.00	1.41	7.25	2.06	7.63	1.69
Totals	Experimental	29	6.93	1.49	7.00	1.41	6.97	1.43
	Control	32	7.06	1.43	6.75	0.96	6.72	1.55

Table H-16

Means and Standard Deviations for Posttreatment CLDMA
Item 8 (Recycle If Necessary) Score

Class/Instructor Group		N	Males M	Males SD	Females M	Females SD	Totals M	Totals SD
#1	Experimental	8	6.00	1.83	5.50	1.29	5.75	1.49
	Control	8	6.00	2.16	7.25	2.06	6.63	2.07
#2	Experimental	8	7.00	1.15	6.25	1.89	6.63	1.51
	Control	8	7.25	2.06	6.25	2.99	6.75	2.43
#3	Experimental	5	5.50	0.71	7.67	0.58	6.80	1.30
	Control	8	7.00	1.22	4.00	1.73	5.88	2.03
#4	Experimental	8	8.00	0.82	8.00	0.82	8.00	0.76
	Control	8	7.50	1.73	7.50	1.73	7.50	1.60
Totals	Experimental	29	6.79	1.48	6.80	1.57	6.79	1.50
	Control	32	6.94	1.71	6.40	2.38	6.69	2.04

APPENDIX I

ANALYSIS OF VARIANCE OF CAREER DECISION-MAKING SKILLS ASSESSMENT EXERCISE (CDMSAE) TOTAL AND SUBSCORES AS A FUNCTION OF TREATMENT, SEX, AND CLASS/INSTRUCTOR

Table I-1

Analysis of Variance of Total Score on the CDMSAE as a Function of Treatment, Sex, and Class/Instructor

Source of Variation	df	Mean Square	F	P
Main Effects	5	353.406	2.656	.035
Treatment	1	1007.040	7.567	.009
Sex	1	50.908	0.383	.539
Class/Instructor	3	221.503	1.664	.188
2-Way Interactions	7	168.151	1.264	.290
Treatment x Sex	1	3.539	0.027	.871
Treatment x Class/Instructor	3	286.021	2.149	.107
Sex x Class/Instructor	3	92.253	0.693	.561
3-Way Interaction	3	189.356	1.423	.249
Treatment x Sex x Class/Instructor	3	189.356	1.423	.249
Explained	15	234.144	1.759	.073
Residual	45	133.077		
Total	60	158.343		

Table I-2

Analysis of Variance of
"Define" Subscore on the CDMSAE as a Function
of Treatment, Sex, and Class/Instructor

Source of Variation	df	Mean Square	F	p
Main Effects	5	0.986	0.679	.642
Treatment	1	4.499	3.097	.085
Sex	1	0.006	0.004	.949
Class/Instructor	3	0.238	0.164	.920
2-Way Interactions	7	1.716	1.182	.332
Treatment x Sex	1	1.234	0.850	.362
Treatment x Class/Instructor	3	2.552	1.757	.169
Sex x Class/Instructor	3	1.103	0.759	.523
3-Way Interaction	3	0.562	0.387	.763
Treatment x Sex x Class/Instructor	3	0.562	0.387	.763
Explained	15	1.242	0.855	.615
Residual	45	1.453		
Total	60	1.400		

Table I-3

Analysis of Variance of
"Establish" Subscore on the CDMSAE as a Function
of Treatment, Sex, and Class/Instructor

Source of Variation	df	Mean Square	F	p
Main Effects	5	14.864	2.607	.037
Treatment	1	20.144	3.534	.067
Sex	1	1.932	0.339	.563
Class/Instructor	3	16.565	2.906	.045
2-Way Interactions	7	7.173	1.258	.292
Treatment x Sex	1	2.612	0.458	.502
Treatment x Class/Instructor	3	9.655	1.694	.182
Sex x Class/Instructor	3	5.697	0.999	.402
3-Way Interaction	3	9.306	1.632	.195
Treatment x Sex x Class/Instructor	3	9.306	1.632	.195
Explained	15	10.163	1.783	.068
Residual	45	5.701		
Total	60	6.816		

Table I-4

Analysis of Variance of
"Clarify" Subscore on the CDMSAE as a Function
of Treatment, Sex, and Class/Instructor

Source of Variation	df	Mean Square	F	p
Main Effects	5	10.383	1.905	.112
Treatment	1	15.968	2.929	.094
Sex	1	4.840	0.888	.351
Class/Instructor	3	10.263	1.883	.146
2-Way Interactions	7	8.944	1.641	.149
Treatment x Sex	1	3.014	0.553	.461
Treatment x Class/Instructor	3	12.929	2.372	.083
Sex x Class/Instructor	3	6.212	1.140	.343
3-Way Interaction	3	2.463	0.452	.717
Treatment x Sex x Class/Instructor	3	2.463	0.452	.717
Explained	15	8.128	1.491	.149
Residual	45	5.451		
Total	60	6.120		

Table I-5

Analysis of Variance of
"Identify" Subscore on the CDMSAE as a Function
of Treatment, Sex, and Class/Instructor

Source of Variation	df	Mean Square	F	p
Main Effects	5	3.476	1.424	.234
Treatment	1	9.247	3.787	.058
Sex	1	0.005	0.002	.964
Class/Instructor	3	2.490	1.020	.393
2-Way Interactions	7	3.440	1.409	.225
Treatment x Sex	1	2.099	0.860	.359
Treatment x Class/Instructor	3	5.451	2.232	.097
Sex X Class/Instructor	3	1.991	0.815	.492
3-Way Interaction	3	3.442	1.409	.252
Treatment x Sex x Class/Instructor	3	3.442	1.409	.252
Explained	15	3.453	1.414	.182
Residual	45	2.442		
Total	60	2.695		

Table I-6

Analysis of Variance of
"Discover" Subscore on the CDMSAE as a Function
of Treatment, Sex, and Class/Instructor

Source of Variation	df	Mean Square	F	p
Main Effects	5	28.876	2.313	.059
Treatment	1	75.199	6.023	.018
Sex	1	6.340	0.508	.480
Class/Instructor	3	19.810	1.587	.206
2-Way Interactions	7	12.370	0.991	.450
Treatment x Sex	1	2.145	0.172	.680
Treatment x Class/Instructor	3	21.414	1.715	.177
Sex x Class/Instructor	3	5.284	0.423	.737
3-Way Interaction	3	17.340	1.389	.258
Treatment x Sex x Class/Instructor	3	17.340	1.389	.258
Explained	15	18.866	1.511	.142
Residual	45	12.486		
Total	60	14.081		

Table I-7

Analysis of Variance of
"Eliminate" Subscore on the CDMSAE as a Function
of Treatment, Sex, and Class/Instructor

Source of Variation	df	Mean Square	F	p
Main Effects	5	11.603	3.371	.011
Treatment	1	42.835	12.443	.001
Sex	1	0.599	0.174	.679
Class/Instructor	3	4.742	1.377	.262
2-Way Interactions	7	1.805	0.524	.811
Treatment x Sex	1	0.141	0.041	.840
Treatment x Class/Instructor	3	1.508	0.438	.727
Sex x Class/Instructor	3	2.696	0.783	.510
3-Way Interaction	3	7.782	2.261	.094
Treatment x Sex x Class/Instructor	3	7.782	2.261	.094
Explained	15	6.267	1.820	.062
Residual	45	3.443		
Total	60	4.149		

Table I-8

Analysis of Variance of
"Start" Subscore on the CDMSAE as a Function
of Treatment, Sex, and Class/Instructor

Source of Variation	df	Mean Square	F	p
Main Effects	5	2.250	1.824	.127
Treatment	1	8.243	6.679	.013
Sex	1	0.160	0.130	.720
Class/Instructor	3	.723	0.586	.628
2-Way Interactions	7	1.208	0.979	.459
Treatment x Sex	1	0.001	0.001	.977
Treatment x Class/Instructor	3	1.450	1.175	.330
Sex x Class/Instructor	3	1.276	1.034	.387
3-Way Interaction	3	1.226	0.994	.404
Treatment x Sex x Class/Instructor	3	1.226	0.994	.404
Explained	15	1.559	1.263	.264
Residual	45	1.234		
Total	60	1.315		