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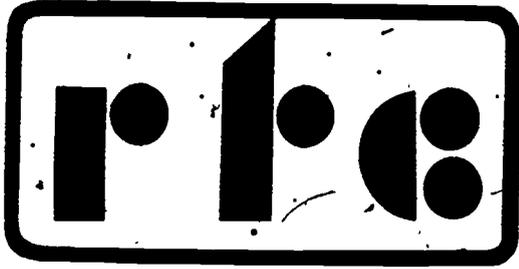
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**ABSTRACT**

Research was conducted to develop and test a structured interview format questionnaire for assessing the vocational decision-making capacities and deficits of vocational rehabilitation clients. Eighty items were developed which tapped three broad domains of problem areas that clients may have in making vocational decisions--problems of information, environmental problems, and problems in making actual decisions. These items were subjected to content validation procedures, using experts in the field. The resulting Vocational Decision-Making Interview (DMI) was then field tested with vocationally undecided clients, vocationally decided clients, and a group of vocationally mixed high school students. Reliability studies showed the instrument to be adequate, while concurrent validity studies with the Career Maturity Inventory-Attitude Scale showed that only one subscale of the DMI failed to correlate significantly with the criterion. Further, data for discriminant validity showed that on DMI total score and two of the three subscales the instrument discriminated significantly between clients who are vocationally decided and vocationally undecided. The newly developed DMI appears to hold promise to the field of vocational rehabilitation as an instrument for determining the vocational decision making problems and deficits of vocational rehabilitation clients. (Author/KC)

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# Research Report

Research and Training Center

## Assessing Vocational Decision-Making In The Rehabilitation Process: Instrument Development

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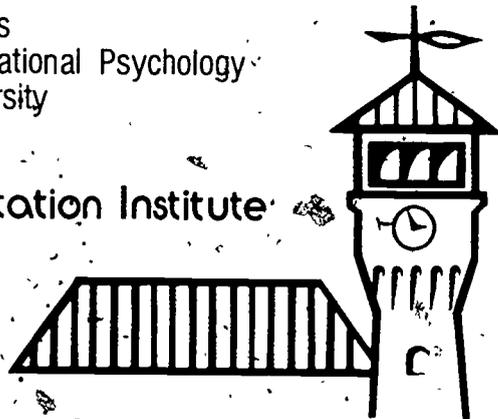
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## ABSTRACT

This study was concerned with developing and testing a structured interview format questionnaire for assessing the vocational decision-making capacities and deficits of vocational rehabilitation clients. Eighty items were developed which tapped three broad domains of problem areas which clients may have in making vocational decisions - problems of information, environmental problems, and problems in making actual decisions. These items were subjected to content validation procedures, using experts in the field. The resulting vocational Decision-Making Interview (DMI) was then field tested with vocationally undecided clients, vocationally decided clients, and a group of vocationally mixed high school students. Reliability studies showed the instrument to be adequate, in that it showed satisfactory internal consistency, and satisfactory patterns in inter-scale and scale with total score correlations. Concurrent validity studies with the Career Maturity Inventory-Attitude Scale showed that only one subscale of the DMI failed to correlate significantly with the criterion. Further, data for discriminant validity showed that on DMI total score and two of the three subscales, the instrument discriminated significantly between clients who are vocationally decided and vocationally undecided. The newly developed DMI, thus, appears to hold promise to the field of vocational rehabilitation as a potential instrument for determining the vocational decision-making problems and deficits of vocational rehabilitation clients.

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This article is based in part on a dissertation submitted by the second author to the Department of Counseling and Educational Psychology, Michigan State University, in partial fulfillment for the requirements of the doctorate degree. The authors wish to thank the faculty of that department for their valuable assistance throughout the course of this study.

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## I. INTRODUCTION

Clients receiving vocational rehabilitation services are confronted with a major decision -- they must identify a realistic vocational goal. In this regard, they are not different from nonhandicapped individuals, who also have to make such decisions. Because of the limitations placed upon them by their disability, however, and because of the relatively short period of time that they receive rehabilitation services, clients are under more pressure to make "realistic" choices.

It can be assumed that clients, like nonhandicapped individuals, will differ in terms of the amount and types of problems they face in making vocational decisions. Clients will range from individuals who have made a decision, are satisfied with it, and know how to implement it, to those who have an "indecisive disposition" (Holland and Holland, 1977). These persons lack the necessary skills to go about acquiring information, making a vocational decision, and/or implementing that decision.

While the topic of vocational indecision is germane to all individuals, including vocational rehabilitation clients, rehabilitation clients have been very little studied in this regard. As Thoresen and Ewart (1976) point out, most research dealing with vocational indecision has considered only high school and college populations. Future research, they suggest, should take into account a wider range of individuals, including clients, women, minorities, and adult career-changers.

Studies to date have covered a wide range of topics relevant to understanding the issues and problems surrounding the vocational decision-making process. This research includes studies of the effects of anxiety and emotions in general upon vocational decisions (Hawkins et al., 1977, Toda, 1980); the effect that the trait of risk-taking has upon vocational decisions

(Davidshofer, 1976); and how self-concept is related to vocational maturity and vocational choices (Barret and Tinsley, 1977; Ware and Pogge, 1980; Lunnenborg, 1976). Other studies have investigated the stability of vocational interests and their classification over time (Hansen and Stocco, 1980; Harmon and Zytowski, 1980), and the strategies individuals use to avoid making vocational decisions (Rosenberg, 1977). Also, research has examined the effects of sex differences or female perspectives on vocational decisions (Tinsley and Faunce, 1978; Harren et al., 1979; Harren and Biscardi, 1980; Yuen et al., 1980; and Tinsley and Faunce, 1980), as well as other inter- and intra-personal factors as they relate to vocational indecisions (Holland et al., 1975; Osipow et al., 1976; Holland and Holland, 1977; O'Neil et al., 1980; Reilly and Caldwell, 1980; and Jones and Chenery, 1980). One study (Rosenberg, 1979) has addressed the effect which work setting has on the job satisfaction of retarded adults. From a somewhat different perspective, a number of studies have explored the effects which different counseling techniques have on career indecision (Mendonca and Siess, 1976; Krivatsky and Magoon, 1976; and Rubington, 1980), and one study reviewed attempted to develop outcome criteria to measure the effects of such counseling (Thompson and Wise, 1976).

Less specific and more basic aspects of vocational decision-making and human decision-making in general have also been investigated (Mostelle and Noguee, 1954; Edwards, 1954; Savage, 1954; Luce and Raiffa, 1957; Coombs, 1964; Edwards and Eversly, 1967; Keeney and Raiffa, 1976; Eshragh, 1980; Herriot et al., 1980; and Pitz and Harren, 1980). And even more abstractly, a recent article has examined decision-making from a philosophical point of view (Szaniawski, 1980).

This sample of the literature shows that quite a bit of work has been done in the area of decision-making, and specifically in vocational decision-

making. Yet only the one article by Rosenberg (1979) dealt specifically with a special population (retarded adults) served by rehabilitation. Thus, little is known about rehabilitation clients' vocational indecision or about possible remediation or treatment strategies directed toward this realm.

As one might then expect, no specific service directly focuses on client decision-making problems during their rehabilitation. The systematic gathering of client vocational information for planning and prediction purposes is considered the prime activity of Vocational Evaluation. A second activity, not often emphasized or considered in Vocational Evaluation, consists of using that information to assist the client in making vocational decisions, and evaluating the extent to which the client is capable of making vocational decisions. Vocational Evaluation appears to be the appropriate service within the rehabilitation process to begin such treatment, since this service is concerned with obtaining the very necessary vocational, client, and contextual information which can be used to both define and impact upon client vocational decision-making.

In Vocational Evaluation, the specification of decision-making skills is typically restricted to statements such as "can't make a vocational choice," "has made an unrealistic vocational choice," "doesn't know what he wants to do," etc. In some specific programs, attempts are made to assist clients in making realistic vocational choices through extensive interaction with the clients. In others, clients do not even know why they are there. The involvement of clients in processing information which rehabilitation professionals obtain about them and in making vocational decisions is important, not only in Vocational Evaluation, but in subsequent services as well. If clients do not actively participate in their own rehabilitation by accepting the responsibility for vocational decisions, then such decisions will be made for them by the various professionals with which the clients interact.

Such vocational decision-making skills are important for clients not only to enable them to participate in their own rehabilitation process, but also later, when they are hopefully functioning independent of the rehabilitation system.

There is a definite need in vocational rehabilitation to consider the complexities clients face in making vocational decisions and to develop a means by which service providers can accurately determine what strengths or deficits clients may have in various aspects of making vocational decisions. The development of an accurate tool for assessing client vocational decision-making capacities -- an instrument that is reliable and valid -- would enable vocational evaluators and other rehabilitation professionals to identify clients who may have difficulties in making vocational decisions, and where problems exist, to determine specifically what the problems may be. Once these are accurately identified for individual clients, it is possible to develop strategies for remediation of vocational indecision which then help them deal with and overcome particular impediments to their vocational decision-making.

There is currently no instrument for assessing vocational decision-making capacity that is appropriate for rehabilitation clients. The specific problems in this realm faced by rehabilitation clients have certain elements which are unique to them, and these specific problems must be addressed if an assessment method is to be appropriate for such clients. One classification system of vocational choice problems suggested by Osipow et al. (1976), however, appears to be quite relevant to vocational rehabilitation clients. These authors saw vocational decision-making problems in terms of three categories: Informational Problems; Decision-Making Problems; and Environmental Problems. Any instrument using these categories is likely to yield a description of undecided individuals that assigns them to a number of sub-types of

undecided individuals, as suggested by Holland and Holland (1977).

Thus, a useful tool for assessing client vocational decision-making must be directed toward problem areas in vocational decision-making that are germane to this group of clients. In addition, such an instrument must provide data that is useful to vocational evaluators and rehabilitation counselors, it must be easily administrable, and it must be constructed so that clients of varying backgrounds and capacities can easily understand individual items and thus give responses that are valid indications of their vocational decision-making problems.

This study was directed toward the development of a valid tool for use in practice and research. The vocational decision-making problems of selected groups of vocational rehabilitation clients, and the range of decision-making skills they used, were studied. Then the tool to measure how well a client has developed these skills and abilities, called the vocational Decision-Making Interview (DMI), was constructed and validated.

## II. METHOD

### Instrument Development Phase

The basic framework used in this study for classification of vocational decision-making problems was based upon the format described by Osipow et al. (1976), mentioned on page 4. Based on this and other literature reviewed, three basic categories of possible problems in vocational decision-making were discerned:

1. Problems of information. Vocational indecision is based upon having an inadequate information base with which to make such decisions. Included in this category are lack of information about self (e.g., needs, interests, etc.) and lack of information about occupations and the world of work.
2. Problems in making actual decisions. The individual may lack or have inadequately developed skills to use information. This may include problems of knowledge, capacity, or experience necessary to make functional decisions concerning vocations.
3. Environmental problems. Difficulties in making vocational choices may stem from factors external to clients themselves, such as economic factors, family pressures, and transportation. These include problems in incorporating these variables into formulating a functional vocational decision.

Given that basic framework, items were constructed which could tap various facets of the trichotomy. Sixty-eight such items served as the original basis for the DMI.

This pool of items was subjected to a content validation procedure in which ten experts in the content area conducted two Q-sorts on the items. In

the first sort, they ranked each item in terms of its assignment to the three categories. In the second Q-sort, they ranked each item in terms of how well it related to the category. From this procedure, and the changes suggested by the raters, a number of revisions in the item pool were made, resulting in a pool of 70 items to be used in field testing.

The items were field tested with clients at two vocational rehabilitation facilities. Field testing was directed primarily toward improving administration of the DMI, clarifying instructions, and determining usability of the data. Revision from the field test were mostly in terms of how particular open-ended items were phrased and subsequently coded for scoring.

This revised version of the DMI based upon the field testing was used in the present study. Representative items of the DMI can be seen in Appendix A. The full instrument contains a total of 80 items in three sections. The first section (7 items) contains preliminary questions which address issues felt to be important in making vocational decisions (e.g., I have decided what kind of job I would like to have). The second section has the 70 items developed for this study. And the third section has three open-ended questions tapping additional information about decision-making needs and problems.

For all items in the first two sections, the subjects indicate whether each item is "True" or "False" for themselves, or whether they are "Not Sure" if the item is true for themselves. Also, for 36 of these items the subjects are provided a prompt which allows them to demonstrate whether their "True" or "False" responses are accurate.

Non-prompted and prompted items are scored in two distinct ways. For the non-prompted items, scores can be either 0 or 1. Positive items (those on whom agreement is indicative of positive decision-making capacity) are scored with "True" being counted as 1, and "Not Sure" and "False" counting as 0. Negative items are scored in reverse, with "False" counting 1, and "Not Sure"

and "True" counting 0.

For each prompted item, a scoring key was developed on the basis of the responses made by subjects during the field testing. This key permits each prompted item to be scored as either a 1 or 0 (1 reflects positive decision-making capacity), comparable to the non-prompted items. The three items in section 3 are also scored on a 1, 0 basis.

Each of the 80 items, thus, is scored on a 1 or 0 basis, with a 1 reflecting a positive response, and a 0 reflecting a "Not Sure" or negative response. The range of scores possible on this version of the DMI is from 0 to 80, and the higher the score of an individual, the fewer problems the individual should have in making vocational decisions. Conversely, a low score should be indicative of vocational indecision.

### Reliability and Validity Studies

#### Research Questions

In the construction and validation of the DMI, a number of specific research questions and hypotheses were set forth. The major ones were:

1. Does the DMI evidence satisfactory reliability, as indicated by measures of internal consistency of the scales and the items?
2. Does the DMI evidence satisfactory concurrent validity, using measures chosen to be indicative of vocational decision-making capacity?
3. Does the DMI display satisfactory discriminant validity, by being able to distinguish between groups of clients who were chosen a priori to differ in levels of vocational decision-making capacities?

## Subjects

Three groups of subjects were chosen for this study to represent groups of individuals who could be expected to differ in their decision-making capacities. If a measure of vocational decision-making is valid, it should distinguish between a group of individuals which is known to be low in vocational decision-making capacity and a group which is known to be higher in this capacity.

Clients who had completed at least half of a specific vocational skill training program were selected to represent "vocationally decided" individuals, while clients receiving vocational evaluation were selected to represent relatively "vocationally undecided" individuals. High school seniors were selected as a third comparison group, since it was expected that they would represent a mixture of vocationally decided and undecided individuals, and, as a whole, should fall at an intermediate level of vocational decision-making capacity. The primary comparison of interest, however, was between the "undecided" evaluation clients and the "decided" training clients.

Each sample consisted of 30 subjects. The vocationally undecided (evaluation) clients and the vocationally decided (training) clients were obtained at two vocational rehabilitation facilities in Michigan. The high school students were obtained at a public school in the same general area.

Control over comparability between undecided and decided groups was maintained by matching each training client to an evaluation client on as many of these variables as was available: sex, disability, age, education, and verbal I.Q. As less than 10% of the clients at one facility were female, only males were used in the study. The high school subjects were not matched, but were a random sample of the male seniors at that particular high school. The high school itself, however, was chosen because its student mixture closely matched the urban and rural mix of client backgrounds at the two rehabilitation facil-

ities.

### Instruments Administered

Each subject was administered two instruments:

1. Vocational Decision-Making Interview. This has been described above.
2. Career Maturity Inventory - Attitude Scale (CMI). This instrument has been used in prior studies as a measure of attitude toward making vocational decisions and entry into the world of work. The CMI-Attitude Scale taps five clusters of attitudes: involvement in the career choice process, orientation toward work, independence in decision-making, preference for career choice factors, and conceptions of the career choice process. These attitudinal dimensions are particularly germane to vocational decision-making. The CMI was administered in order to estimate the concurrent validity for the DMI.

Background data were also obtained from subject records and the subject's counselor or evaluator. Demographic data were obtained on the subject's age, race, disability, measured intelligence, employment history and preference, other training, and parent's employment. These data were gathered to help describe vocationally decided or undecided individuals, and to ascertain comparability of groups on a number of demographic variables. Counselors or evaluators also indicated on three items their own judgments of the realism of subjects' job choices and subjects' independence in vocational decision-making, and these judgments were used as independent criteria of subject vocational decision-making capacity.

### Procedures

Five experimenters collected the data. Each experimenter was trained

in the administration of the two instruments, and a standard protocol for testing each subject was followed:

1. An experimenter met individually with each subject. The nature and purposes of the study were explained, and subjects were given the option of declining to participate. Each subject who agreed to participate was read an informed consent agreement which he then signed.
2. Each subject was then individually and orally interviewed with the DMI. The experimenter recorded both the subject's responses to "True, Not Sure, False" items and responses to prompted questions on the interview form for later scoring. Administration of a DMI ranged from 30 minutes to one hour and 15 minutes, with an average time of approximately one hour.
3. At the end of each day, all subjects who had completed a DMI met as a group and completed the CMI. This was administered orally, and each subject recorded his own responses on an answer sheet. Administration of the CMI took about 30 minutes.
4. The counselor or evaluator who had the most direct contact with a subject completed three items (pertaining to the realism of the subject's job choices and the subject's independence in vocational decision-making), on the same testing day. These appraisals were recorded on a simple Counselor/Evaluator Form.

### III. RESULTS

#### Subject Characteristics

Demographic data collected on all 90 subjects are presented in Table 1. The primary comparison on these demographic characteristics was between the undecided and the decided client groups. Chi-squares were computed between these two groups on each demographic variable and no significant differences on any of the demographic variables were found. As intended, the two client groups are comparable on relevant demographic variables. By the nature of the sample, one would not expect the high school group to be comparable to the two client groups on all of the demographic variables (i.e., age, education, race, source of income, Bureau of Rehabilitation status, type and severity of disability, time since last job, and combined time in last three jobs).

A picture of the client sample can be constructed based on these variables. In terms of age, most (63.3%) were fairly young -- between the ages of 17 and 25. A majority (75%) had twelve or more years of education, were predominantly white (93.3%) and receiving public assistance (80%). The primary disability was orthopedic (40%) and almost half the clients (46.7%) were judged as severely disabled. Three-fourths of the clients (75%) had been unemployed between one month and two years, and over half (55%) had been employed at their job from one to six months. Over two-fifths of the clients (43.3%) had a combined job history (time in their last three jobs) ranging from one to five years, with another notable proportion (16.7%) only having a job history of one to six months. While there is some heterogeneity in the client group on these variables, the clients in the samples appear to be quite similar to vocational rehabilitation client populations generally served in rehabilitation facilities.

A further source of demographic information useful in ascertaining the

TABLE 1  
DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLES<sup>1</sup>

DEMOGRAPHIC VARIABLES	VOCATIONALLY UNDECIDED CLIENTS (EVALUATION CLIENTS) n=30 %	VOCATIONALLY DECIDED CLIENTS (TRAINING CLIENTS) n=30 %	ALL CLIENTS N=60 %	CHI-SQUARE RESULTS DECIDED VS. UNDECIDED CLIENTS			VOCATIONALLY MIXED SUBJECTS (H.S. STUDENTS) n=30 %
				$\chi^2$	d. f.	p-level	
AGE							
17 to 25 years	60.0	66.7	63.3	.85	2	.66	100.0
26 to 35 years	30.0	20.0	25.0				0.0
36 to 44 years	10.0	13.3	11.7				0.0
EDUCATION COMPLETED							
0 to 8 years	3.3	10.0	6.7	1.29	2	.53	0.0
9 to 11 years	16.7	20.0	18.3				100.0
12 or more years	80.0	70.0	75.0				0.0
RACE							
White	93.3	93.3	93.3	2.00	3	.58	100.0
Black	3.3	3.3	3.3				0.0
American Indian	0.0	3.3	1.7				0.0
Spanish Surname	3.3	0.0	1.7				0.0
SOURCE OF INCOME							
Self	10.0	3.3	6.7	1.08	2	.59	13.3
Family	13.3	13.3	13.3				80.0
Public Assistance	76.7	83.3	80.0				6.7
BUREAU OF REHABILITATION STATUS							
Client	100.0	100.0	100.0	0.00	1	-	0.0
Non-Client	0.0	0.0	0.0				100.0
PRIMARY DISABILITY							
Visual Impairment	6.7	6.7	6.7	0.00	6	-	0.0
Hearing Impairment	3.3	3.3	3.3				0.0
Orthopedic Impairment	40.0	40.0	40.0				0.0
Mental Illness	26.7	26.7	26.7				0.0
Mental Retardation	16.7	16.7	16.7				0.0
Other Physical or Mental	6.7	6.7	6.7				0.0
None	0.0	0.0	0.0				100.0
SEVERITY OF DISABILITY							
Severely Disabled	53.3	40.0	46.7	1.07	1	.30	0.0
Not Severely Disabled	46.7	60.0	53.3				100.0
TIME SINCE LAST JOB							
Never Employed	6.7	16.7	11.7	4.64	6	.59	3.3
1 to 6 months	26.7	20.0	23.3				90.0
7 to 12 months	23.3	26.7	25.0				3.3
13 to 24 months	33.3	20.0	26.7				3.3
25 to 60 months	10.0	10.0	10.0				0.0
61 to 120 months	0.0	3.3	1.7				0.0
121 or more months	0.0	3.3	1.7				0.0
TIME IN MOST RECENT JOB							
Never Employed	6.7	16.7	11.7	9.56	6	.15	3.3
1 to 6 months	50.0	60.0	55.0				63.3
7 to 12 months	6.7	6.7	6.7				13.3
13 to 24 months	13.3	3.3	8.3				13.3
25 to 60 months	13.3	0.0	6.7				6.7
61 to 120 months	10.0	6.7	8.3				0.0
121 or more months	0.0	6.7	3.3				0.0
COMBINED TIMES IN LAST THREE JOBS							
Never Employed	6.7	16.7	11.7	5.04	6	.54	3.3
1 to 6 months	16.7	16.7	16.7				40.0
7 to 12 months	6.7	13.3	10.0				16.7
13 to 24 months	23.2	16.7	20.0				23.3
25 to 60 months	26.7	20.0	23.3				16.7
61 to 120 months	13.3	3.3	8.3				0.0
121 or more months	6.7	13.3	10.0				0.0

<sup>1</sup>The vocationally decided client group consisted of 30 clients completing a specific skill training program. The vocationally undecided client group consisted of 30 persons in vocational evaluation. The vocationally mixed group consisted of 30 randomly selected male high school seniors.

criterion groupings came from the counselor's or evaluator's rating (on the Counselor/Evaluator Form) of the realism of the subjects' job or career choices (assessed on the DMI), and of the independence of the decision-making used in making these choices. The results (Table 2) of Chi-square analyses revealed no significant differences between the Undecided, Decided, and Mixed groups on the three items.

### Reliability Studies

For the reliability studies conducted with the DMI, all 90 subjects were used in the analyses, as these provided the broadest range on vocational decision-making. Thus, the sample consisted of 30 vocationally undecided subjects (evaluation clients), 30 vocationally decided subjects (training clients), and 30 vocationally mixed subjects (high school students). DMI data on the 90 subjects was analyzed with a number of procedures.

First, the internal consistency of the logically constructed scales and the total DMI was determined. DMI items were originally developed to represent three categories of problem areas in making vocational decisions -- problems of information, problems in making actual decisions, and environmental problems. Two of these categories were subdivided for the analysis of internal consistency of the original version of the DMI. The items under "Problems of Information" were separated into two categories: (1) self-information problems; and (2) occupational information problems. Decision-making problems were subdivided into: (1) acquisition of information, processing of information, and skills in choosing; and (2) success in previous choices, responsibility/control, and anxiety/fear of decision-making. This resulted in six categories of items, as well as a DMI total score. Internal consistency reliability coefficients were computed using Hoyt's method (Guilford, 1954). The results showed that the DMI as a whole, as well as the

TABLE 2  
COUNSELOR/EVALUATOR RATINGS FOR THE VOCATIONALLY DECIDED,  
VOCATIONALLY UNDECIDED, AND VOCATIONALLY MIXED GROUPS

QUESTIONS TO EVALUATOR OR COUNSELOR	RESPONSES	PERCENTS IN SAMPLES			CHI-SQUARE RESULTS	
		VOCATIONALLY UNDECIDED (1)	VOCATIONALLY DECIDED (2)	VOCATIONALLY MIXED (3)	3-SAMPLE COMPARISONS $\chi^2$ df p-level	SAMPLE 1 vs. 2 COMPARISONS $\chi^2$ df p-level
IS SUBJECT'S OCCUPATIONAL CHOICE REALISTIC?	YES	53.6	70.0	51.9	$\chi^2 = 3.23$ df = 4 p $\leq$ .52	$\chi^2 = 2.02$ df = 2 p $\leq$ .38
	NO	21.4	10.0	25.9		
	DON'T KNOW	25.0	20.0	22.2		
IS SUBJECT'S CAREER/TRAINING CHOICE REALISTIC?	YES	53.6	62.1	51.9	$\chi^2 = 2.22$ df = 4 p $\leq$ .70	$\chi^2 = 1.16$ df = 2 p $\leq$ .57
	NO	25.0	13.8	29.6		
	DON'T KNOW	21.4	24.1	18.5		
DOES SUBJECT INDEPENDENTLY MAKE A JOB/CAREER DECISION?	YES	44.4	50.0	66.7	$\chi^2 = 5.85$ df = 4 p $\leq$ .21	$\chi^2 = 1.62$ df = 2 p $\leq$ .45
	NO	22.2	10.0	3.7		
	DON'T KNOW	33.3	40.0	29.6		

subscales separately, evidence adequate internal consistency, as shown in table 3.

Next, item analysis procedures were conducted to determine whether some items could be eliminated. Indexes of discrimination and item difficulty revealed seven items which were both poor discriminators between subjects (across groups) who scored high or scored low on the total test as well as being answered positively by most of the subjects. These items were then removed from the scores in further DMI analyses. These seven items and their respective discrimination and difficulty data are presented on Table 4. Omitting these items reduced the DMI from 80 to 73 items.

Having reduced the DMI to 73 items, it was considered necessary to reconsider the original scales developed. As mentioned, the original scales were developed on a theoretical basis, using past research and the experiences of a number of rehabilitation professionals. At this point in the development of the DMI, however, it was considered necessary to determine not only which items fit together theoretically, but also to determine which items correlated closely enough to be considered part of the same scale. That is, the DMI scales should reflect empirical findings as well as be based on a theoretical foundation.

To accomplish this, Pearson Product Moment correlations were computed for each possible pair of items on the DMI, using the total sample of 90 subjects. Then, using the scales originally developed as a theoretical basis, and noting those pairs of items that had positive correlations ( $p \leq .05$ ), new scales were developed. Items placed into those scales had significant correlations and were theoretically related as well. This procedure resulted in reorganization of the DMI into three new scales:

1. Employment Readiness. This scale contains 20 items. The focus of the items in this scale is on examining the individual's

TABLE 3  
INTERNAL CONSISTENCY ESTIMATES FOR THE  
ORIGINAL VERSION OF THE DECISION-MAKING INTERVIEW (DMI)

DMI SCALES	NUMBER OF ITEMS	r	p-level
Total DMI Score	80	.8363	.001
Self-Information Problems	16	.4721	.001
Occupational-Information Problems	14	.7311	.001
Decision-Making Problems			
a. acquisition of information, processing of information, and skills in choosing	13	<del>.5894</del>	.001
b. success in previous choices, responsibility/control, and anxiety/fear of decision-making	11	.6527	.001
Environmental Problems	16	.4308	.001
Section One and General Questions	10	.5819	.001

TABLE 4

INDEX OF DISCRIMINATION AND INDEX OF DIFFICULTY  
FOR ITEMS REMOVED FROM THE DECISION-MAKING INTERVIEW (DMI)

SCALE	ITEM NUMBER	ITEM	INDEX OF DISCRIMINATION	INDEX OF DIFFICULTY(%)
Section One	1	I want to get a job soon.	.095	81
Section One	2	I should decide on a job soon.	-.095	83
Decision-Making Problems b. anxiety/fear of decision-making	61	I would like to avoid making a decision about a job.	.000	81
Environmental Problems*	66	My friends (family, spouse) want me to get a job.	.095	94
Environmental Problems	70	I would be better off financially from various types of aid and social services than if I got a job.	.048	83
Environmental Problems	71	I can't buy the things I want without getting a job.	.048	92
Environmental Problems	73	Money is one of the reasons to look for a job.	.048	96

desire to obtain work, and the external pressures that may help or hinder the individual's motivation and ability to make a vocational decision.

2. Self-Appraisal. This is a 26 item scale which focuses upon individuals' knowledge and perception of themselves (i.e., their abilities, needs, etc.) and their decision-making history.
3. Decision-Making Readiness. This 27 item scale deals with individuals' readiness to make vocational decisions based on the occupational knowledge they possess and their decision-making skills.

Item and scale statistics were recomputed for the reorganized DMI and its newly developed three subscales. Internal consistency of each subscale and Total DMI scale are adequate, as shown in Table 5. For an initial version of this instrument, the Decision-Making Readiness scale ( $r = .79$ ) and the Total DMI ( $r = .84$ ) are particularly promising.

Inter-scale correlations of the subscales were sufficiently low and their correlations with the Total score were also sufficiently high, as shown in Table 6. Inter-scale correlations ranged from .38 to .55, and scale-to-total correlations ranged from .70 to .88. The DMI is, therefore, sufficiently reliable for use in estimating the degree to which groups of subjects have relatively different levels of vocational decision-making problems.

#### Concurrent Validity

Concurrent validity was estimated by examining the correlation ratios between the DMI (Total and Subscales) and the independent indicator of decision-making capacity -- the CMI-Attitude Scale (described previously).

TABLE 5

## SCALE STATISTICS AND RELIABILITY ESTIMATES OF THE REVISED DMI

DMI SCALE	SCALE STATISTICS				INTERNAL CONSISTENCY	
	NUMBER OF ITEMS	MEAN SCORE	STANDARD DEVIATION	MEAN ITEM DIFFICULTY	r	p-level
Total Score	73	34.3111	9.10	.4700	.8431	.001
Employment Readiness Scale	20	12.7444	2.91	.6372	.6167	.001
Self-Appraisal Scale	26	12.0111	3.60	.4620	.6295	.001
Decision-Making Readiness Scale	27	9.5556	4.76	.3539	.7939	.001

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TABLE 6  
 INTER-SCALE CORRELATIONS<sup>1</sup>  
 FOR THE DECISION-MAKING INTERVIEW

DMI SCALES	(1)	(2)	(3)
Employment Readiness (1)			
Self-Appraisal Scale (2)	.375		
Decision-Making Readiness Scale (3)	.436	.550	
Total Score (4)	.696	.803	.880

<sup>1</sup>All correlations are significant at or beyond the .001 level.

TABLE 7

## CONCURRENT VALIDITY OF THE DMI WITH THE CMI

DMI SCALE	CORRELATION WITH CMI	
	r	p-level
Total Score	.272	.01
Employment Readiness Scale	.227	.03
Self-Appraisal Scale	.249	.02
Decision-Making Readiness Scale	.193	.07

The results of this correlational analysis are presented on Table 7. All correlations were positive, and three of the four correlations were significant ( $p < .05$ ). The Employment Readiness scale, Self-Appraisal scale, and the DMI Total score were significantly positively correlated with the decision-making capacity criterion. The Decision-Making Readiness scale was marginally ( $p \leq .07$ ) correlated with the CMI-Attitude scale. It appears that concurrent validity is promising for the DMI. The Decision-Making Readiness scale does not appear to be tapping an aspect of decision-making directly tapped by the CMI criterion.

#### Discriminant Validity

The criterion established for assessing discriminant validity was that the DMI would distinguish between groups of individuals who are considered relatively different in their capacities to make vocational decisions. The groups chosen were vocationally undecided individuals (represented by voca-

tional evaluation clients) and vocationally decided individuals (vocational training clients completing a specific training program). The vocationally mixed high school students were excluded from these analyses, since they were expected to span a broader continuum of vocational decidedness.

The predictions were that the groups of vocationally decided clients would obtain higher scores on the Total DMI as well as on each of the three subscales than the undecided clients. These predictions were tested with one-tailed t-tests between these two groups on each of the four DMI scores. The results of these analyses are in Table 8.

#### DMI Total Score

This score was the result of subjects' total responses across the 73 DMI items (and thus it summed across the three separate DMI subscales). The mean score for the undecided clients was 31.93, while the mean for the decided clients was 37.33. This 5.4 scale points difference was in the predicted direction, and the difference was significant ( $t = 2.45$ ,  $df = 58$ ,  $p \leq .01$ ). There was also heterogeneity of variances ( $\chi^2 = 6.16$ ,  $df = 1$ ,  $p \leq .01$ ).

#### Employment Readiness Scale

The means for the two groups of subjects on this 20-item scale also differed in the predicted direction. Undecided clients scored a mean of 12.23; while the mean for the decided clients was 13.60 ( $t = 1.90$ ,  $df = 58$ ,  $p \leq .03$ ). Heterogeneity of variances also existed ( $\chi^2 = 7.54$ ,  $df = 1$ ,  $p \leq .01$ ).

#### Self-Appraisal Scale

On this 26-item scale, the patterns were similar, but the difference between the means did not attain significance. Undecided clients scored

TABLE 8  
DISCRIMINANT VALIDITY OF DMI

DMI SCALES	SUBJECTS				t-test <sup>1</sup>			HOMOGENEITY OF VARIANCES BARTLETT'S TEST <sup>2</sup>	
	VOCATIONALLY UNDECIDED		VOCATIONALLY DECIDED		COMPARISONS			x <sup>2</sup>	p-level
	Mean	Standard Deviation	Mean	Standard Deviation	Mean Difference	t	p-level		
Total Score	31.93	10.26	37.33	6.39	5.40	2.45	.01	6.16	.01
Employment Readiness	12.23	3.40	13.60	2.01	1.37	1.90	.03	7.54	.01
Self-Appraisal	11.53	4.16	12.87	3.39	1.34	1.36	.09	1.18	.28
Decision-Making Readiness	8.17	4.84	10.87	3.15	2.70	2.56	.01	5.13	.02

<sup>1</sup>All t-tests are one-tailed, with df = 58.

<sup>2</sup>All Chi-squares have df = 1.

11.53, while decided clients scored 12.87 ( $t = 1.36$ ,  $df = 58$ ,  $p \leq .09$ ). Variances were also not significantly heterogeneous ( $\chi^2 = 1.18$ ,  $df = 1$ ,  $p \leq .28$ ).

#### Decision-Making Readiness Scale

On this scale, the longest of the three (27 items), groups again differed in the predicted direction. The mean score for the undecided clients was 8.17, while the mean score for decided clients was 10.87. This difference was significant ( $t = 2.56$ ,  $df = 58$ ,  $p \leq .01$ ). Variances also differed significantly ( $\chi^2 = 5.13$ ,  $df = 1$ ,  $p \leq .02$ ).

These results showed that, on this sample of clients, the discriminant validity of the DMI appeared quite promising. On Total DMI as well as on two of the three subscales (Employment Readiness and Decision-Making Readiness), rehabilitation clients who are considered more vocationally undecided scored significantly lower than rehabilitation clients who are considered more vocationally decided. On the third subscale (Self-Appraisal), while differences are in the predicted direction, these differences did not reach an acceptable level of statistical significance ( $p \leq .09$ ).

#### IV. DISCUSSION AND CONCLUSIONS

This research project was an initial step in developing a structured vocational Decision-Making Interview (DMI). This instrument is intended to assist evaluators, vocational rehabilitation counselors, and other service providers in the field of vocational rehabilitation in working with clients who have problems making sound vocational decisions. Ultimately, and most importantly, such a tool will be of direct benefit to clients receiving vocational rehabilitation services. As a group, such clients span a wide range of vocational decision-making capacities and stances. Some clients may be quite capable of making their own vocational decisions (and may already have done so), while others may totally lack the basic capacity or experience needed to even begin making vocational decisions. Many service providers are aware of the need to take account of this client variable of vocational decision-making capacity, but heretofore no instrument or tool has existed to directly assess these capacities among vocational rehabilitation client populations. One of the major uses of a tool such as the DMI is that a client's rehabilitation program can be tailored to be of maximum benefit to the client. That is, some clients may be ready to make vocational choices or decisions, whereas other clients, when put into such a decision-making situation, may be unable to make optimal decisions, and could benefit from specifically focused training in vocational decision-making (e.g., training in actual decision-making, in getting information about occupations or about their own assets and liabilities, and so on). Thus, an awareness of a client's specific problems in making vocational decisions should have the benefit of increasing the client's own involvement in his/her rehabilitation process. Many rehabilitation professionals agree that ideally, the process should be a joint effort involving both the professionals and the

client, not merely something that is done to the client.

In addition, the DMI has the potential of specifying, if the client has difficulties in making vocational decisions, where the causes of such difficulties may lie (as assessed by the different subcategories of the DMI). Focusing upon the specific problem areas should enable evaluators or counselors to effectively and efficiently determine what programs or tactics may be of most benefit to the client. This holds the promise not only of more successful closures, but also of minimizing the time required for a client to complete the vocational rehabilitation process. Particularly at times when accountability is extremely important, the emphasis in rehabilitation should be twofold: both the quality and the efficiency of services should be stressed. It is not enough for the service providers to conclude that the client "appears to have some problems in making vocational decisions," but rather the problems must be pinpointed, delineated, and alleviated.

As this study has shown in the results of the first experiments with the DMI, the findings are encouraging. Reliability and validity, as assessed in this study, appear promising for the newly developed instrument. On two of its three subscales as well as on total score, it showed a significant difference between clients who were known to differ in this realm (e.g., vocationally undecided versus vocationally decided clients). Further work, however, must be carried out on the DMI, and such studies are currently in progress. These involve different experimental designs and different groups of subjects.

A number of points should be mentioned. First of all, a positive feature of the DMI is that it is individually and verbally administered. Many clients have difficulties with pencil and paper tests, and verbal administration insures that these clients will not be ruled out from taking the DMI. In addition, individual administration allows for clarifying ambiguities or

uncertainties that some clients may face in completing written instruments, which may not become evident when data are obtained through group administration.

On the other hand, this mode of administration may contribute to the time required for clients to complete the instrument (in addition to the fact that it is a fairly long instrument). The time required to complete the DMI ranges from 30 minutes to one hour and fifteen minutes. Although this is a fairly large amount of time, it is expected that the potential benefits to clients, rehabilitation professionals, and to the rehabilitation system itself will far outweigh the time required. One hour out of the time a client spends in the rehabilitation system is a small price to pay if the instrument indeed is useful and helps improve the quality of services provided to individual clients.

A further point that should be addressed concerns the heterogeneity of variances found in this study. On two of the subscales and the Total DMI, undecided clients showed significantly greater variance in their scores than decided clients. While this is not considered a great statistical problem because of the robustness of the t-test, it does mean that undecided clients were more diverse in their scores. There are several explanations possible for this. Holland and Holland (1977) pointed out that the undecided fall into multiple sub-types. That is, within the undecided population there are sub-groups of individuals rather than one homogeneous group. It may be that the results concerning the variances in this study were a reflection of the presence of such multiple sub-types within the vocationally undecided evaluation group of clients. Then, if the evaluation process improves vocational decision-making capacity, one would expect the clients to score higher (and show more homogeneity in DMI scores) by the time they are in a specific vocational training program (as represented by the decided group). Another

possibility for the heterogeneity of variances may be that the DMI is more sensitive for detecting differences among vocationally indecisive clients than among vocationally decisive clients. Perhaps the vocationally decided group of clients is restricted in range of scores by ceiling effects, which would decrease the variability of scores within this group, relative to the undecided clients. Indeed, other explanations are also possible. The point, however, is that the lower means and the greater variances of the undecided group of clients indicate that this group appears to have vocational decision-making problems, and that, given the variability, any instrument to assess these problems must be sensitive to individual differences within this realm. Further research with the DMI must be aware of the possibility that vocationally undecided clients may be comprised of distinct multiple sub-types, and a specification of these sub-types will be essential in utilizing the DMI in the assessment and diagnosis of individual clients (as opposed to gathering group data).

The continuing research currently being conducted with the DMI is expected to present more definitive data concerning this instrument. If, through the use of different experimental designs and different subjects, and when different fundamental issues have been raised and studied with the DMI, the instrument continues to show promise as a useful tool, then we feel it should be tried out in the field. At this point, the DMI is considered experimental. We feel it is useful now for use in group comparisons, but decisions concerning individual clients should not yet be made based upon this tool. The developmental work and validity testing carried out in the present study shows a promising beginning in an area where work is needed.

Readers interested in further information about the DMI, or in the most recent study being conducted with this instrument, are urged to contact the authors directly.

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APPENDIX

Selected Sample Items from the  
Vocational Decision-Making Interview (DMI)

**EXPERIMENTAL**  
Not for General Distribution

Sample DMI Items from Employment Readiness Scale

- T NS F I have decided what kind of job I would like to have.  
1st Choice: \_\_\_\_\_  
2nd Choice: \_\_\_\_\_  
3rd Choice: \_\_\_\_\_
- T NS F My friends (family, spouse) do not encourage me much to look for a job.
- T NS F If I had to I could move to a different location in or out of town to get a job.
- T NS F I have few job choices, because it is hard for me to get around.
- T NS F I would take a job that my family and/or friends didn't approve of.
- T NS F I know what kind of career I would like to have, that is what type of work I would like to do for the rest of my life.  
1st Choice: \_\_\_\_\_  
2nd Choice: \_\_\_\_\_  
3rd Choice: \_\_\_\_\_

**EXPERIMENTAL**  
Not for General Distribution

Sample DMI Items from Self-Appraisal Scale

- T NS F I know what kinds of work I am good at doing.  
What kinds of work? \_\_\_\_\_
- T NS F I would rather let fate take its course than make a choice about a job.
- T NS F I feel sure of myself when I have to make a decision about a job.
- T NS F If someone asked me, I could describe myself, my personality, accurately.
- T NS F I have let others decide which job was best for me.
- T NS F I know what types of work would be interesting to me.  
What types of work? \_\_\_\_\_

Sample DMI Items from Decision-Making Readiness Scale

T NS F I know how much education or training I need for jobs that I would like to have.  
How much education or training? \_\_\_\_\_

T NS F There are some jobs that are interesting to me.  
Name three jobs: 1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_

T NS F I could name some of the benefits that I should consider to decide on a job.  
Name three benefits: 1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_

T NS F I would be good at choosing a job on my own.

T NS F I understand the responsibilities that are common to all jobs.  
Name three responsibilities that are common to all jobs:  
1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_

**EXPERIMENTAL**  
**Not for General Distribution**

T NS F I have enough information on opportunities and requirements to decide about jobs.  
Name three job opportunities:  
1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_