

minnesota studies in  
vocational rehabilitation: xxviii

*Manual for the  
Minnesota  
Importance Questionnaire*

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*Minnesota Studies In Vocational Rehabilitation are supported, in part, by Research Grant 12-P-55192/5-07 from the Social and Rehabilitation Service, Department of Health, Education, and Welfare, Washington, D.C. 20201.*

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All computations reported in this monograph were performed at the University Computer Center, University of Minnesota. Portions of the computations were supported by a grant of subsidized time from the University Computer Center.

# The Minnesota Studies in Vocational Rehabilitation

The Minnesota Studies in Vocational Rehabilitation are a series of monographs published by the Work Adjustment Project, reporting research studies being conducted on the general problem of adjustment to work. These studies, begun in 1957, have two objectives: (1) development of tools for predicting and measuring an individual's work adjustment; and (2) exploration of the process of adjustment to work. These primary goals are embodied in a conceptual framework for research, entitled *A Theory of Work Adjustment* (Dawis, England and Lofquist, 1964; Dawis, Lofquist and Weiss, 1968). This theory focuses on interaction between the work personality and the work environment as a way of conceptualizing the process by which an individual adjusts to work.

The *Theory of Work Adjustment* states that vocational abilities and vocational needs are the significant aspects of the work personality, while ability requirements and reinforcer systems are the significant aspects of the work environment. Work adjustment is predicted by matching an individual's work personality with work environments. How well an individual's abilities correspond to the ability requirements of the job will predict the satisfactoriness of his work, and how well his needs correspond to the reinforcers available in the work environment will predict his satisfaction with his work.

Measurement devices are required to make the *Theory of Work Adjustment* operational. A worker's abilities can be measured with the General Aptitude Test Battery (U.S. Department of Labor, 1970b). His needs may be assessed using the Minnesota Importance Questionnaire (Weiss, Dawis, England and Lofquist, 1964a,b; Weiss, Dawis, Lofquist and England, 1966). Ability requirements for jobs are described by Occupational Aptitude Patterns (U.S. Department of Labor, 1970a), while job reinforcer systems have been described by Occupational Reinforcer Patterns (Borgen, Weiss, Tinsley, Dawis and Lofquist, 1968a,b). The worker's satisfaction can be measured with the Minnesota Satisfaction Questionnaire (Weiss, Dawis, England and Lofquist, 1967), and his satisfactoriness with the Minnesota Satisfactoriness Scales (Gibson, Weiss, Dawis and Lofquist, 1970).

## Summary

The present monograph describes the Minnesota Importance Questionnaire (MIQ), a measure of one of the significant aspects of the work personality — vocational needs. It is intended to serve as a manual for use of the MIQ. It

includes a discussion of the counseling use and interpretation of MIQ scores, and additional technical data about the development, reliability and validity of the MIQ.

The 1967 Revision of the MIQ is a 210-item pair-comparison instrument designed to measure the following twenty vocationally-relevant need dimensions: Ability Utilization, Achievement, Activity, Advancement, Authority, Company Policies and Practices, Compensation, Co-workers, Creativity, Independence, Moral Values, Recognition, Responsibility, Security, Social Service, Social Status, Supervision — Human Relations, Supervision — Technical, Variety and Working Conditions. The MIQ is self-administering and can be completed in 30-40 minutes. It has a reading difficulty level equivalent to the 5th grade. Administration of the MIQ requires both re-usable booklets and consumable answer sheets.

A completed MIQ is scored on each of the twenty need dimensions listed above. In addition, a validity score, the total circular triad (TCT) score, is reported to indicate random responding and other forms of invalid responding on the MIQ. Circular triads are also used to compute error bands for each of the twenty need scores. Need scores are reported in the form of a computer-printed profile.

An MIQ profile may be interpreted in terms of the importance to the individual of the twenty work reinforcers. (Needs may be defined as preferences for specific job-related reinforcers.) Thus, one worker may prefer Ability Utilization and Recognition while another prefers Social Status and Security. The resulting MIQ profile represents the individual's preferences for job-related reinforcers without reference to anyone else, i.e., the profile is not of the normative type. The MIQ profile may also be interpreted in terms of its similarity (correspondence) to Occupational Reinforcer Patterns (ORPs; see Monograph XXIV of the *Minnesota Studies in Vocational Rehabilitation*). The degree of correspondence of the MIQ profile to each of 81 occupations for which ORPs are currently available is reported. This correspondence can be used by the counselor as the basis for identifying occupational areas in which the individual would be predicted to be satisfied.

Median internal consistency reliability coefficients for the twenty MIQ scales in several subject groups were generally in the .80's. Median stability (test-retest) coefficients for the twenty MIQ scale scores ranged from a high of .89 for an immediate test-retest interval to a low of .48 for a 6 month test-retest interval. For MIQ profiles, however, median stability coefficients were in the .80's. Scale intercorrelations ranged from .05 to .77, with a median of .30.

Validation of the 1967 MIQ form consisted of content validity studies, group difference studies and concurrent validity studies. More detailed information on the reliability and validity of the MIQ can be found in the Technical Section.

# Implications for Vocational Rehabilitation Practice

The MIQ can be used by the vocational rehabilitation counselor in a number of ways. It can be used to assess the vocational needs of his clients in the context of vocational planning with that client. With the MIQ, the counselor can help the client look at jobs in terms of the correspondence between his/her vocational needs and reinforcer patterns in occupations. Considering need-reinforcer correspondence together with the correspondence between the client's abilities and the ability requirements of jobs, the counselor can proceed to help the client decide on the occupations in which he would most likely be both satisfied and satisfactory.

The MIQ can also be used by the vocational rehabilitation counselor to prepare for the counseling relationship. For example, a high Security score combined with a low Responsibility score may indicate a more supportive, actively helping approach with a client, while the opposite (low Security, high Responsibility scores) may indicate allowing the client relatively more initiative and a more active role in the counseling relationship.

The MIQ can be used to assess changes in the client's vocational needs, in particular, changes which result from the onset of disability. Pre-disability needs might be inferred from the ORPs of satisfying jobs previously held by the client. Comparison of pre- and post-disability needs might provide useful insights into the impact of becoming disabled, e.g., that the client has become less achievement-oriented and more security-conscious. Such insights may be significant not only for vocational planning with the client, but also for the management of the rehabilitation process for the client.

As a final illustration, the MIQ can be used to help a client plan effective and satisfying use of his non-work time. This can be especially helpful when the nature of the client's disability limits his choice of work to jobs which are not satisfying for him. Non-work activities can then be chosen which would provide him with satisfaction for those needs which are not satisfied at work.

## Recommendations for Use

The MIQ is designed for use only by trained professional personnel. Appreciation of its capabilities and limitations requires a thorough grasp of the technical nature of the instrument and a competence in reading and interpreting research studies on the MIQ. The questionnaire itself requires no more than a 5th grade reading level and should be applicable to most groups. Research evidence indicates that the MIQ can be used with minority and low socioeconomic status groups (Hendel and Weiss, 1970b).

Although the MIQ can be used alone, its most effective use is through matching an individual's MIQ profile with specific ORPs, as programmed by the

computer scoring service provided by Vocational Psychology Research at the University of Minnesota. Because the MIQ was developed for the *Theory of Work Adjustment*, its most legitimate application is within that theory's framework.

Care should be taken not to over-extrapolate the information provided by the questionnaire. The MIQ does provide data on twenty vocationally relevant needs, but obviously these do not constitute all the elements involved in vocational choice and career planning and development. Even with the inclusion of the complementary factor of ability there are still questions of job availability and outlook, and personal or individual circumstances which the counselor must consider to provide the most effective service to his clients. Within this larger picture, the MIQ is a useful tool for vocational rehabilitation counselors and their client's vocational planning.

Copies of the MIQ and authorization to use it may be obtained by writing to:

Vocational Psychology Research  
Elliott Hall  
University of Minnesota  
Minneapolis, Minnesota 55455

Requests should include a description of how the MIQ is to be used and the professional qualifications of the persons who will use it.

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# Manual for the Minnesota Importance Questionnaire

## Section I. Description and Use

### Description

The Minnesota Importance Questionnaire (MIQ), 1967 revision, is a 210-item pair-comparison instrument designed to measure twenty vocationally-relevant need dimensions. These need dimensions refer to specific reinforcing conditions which have been found to be important to job satisfaction. The statement representing each dimension was chosen from analyses of an earlier Likert form of the MIQ as that statement which best represented the scale. The statements used to represent each of the twenty vocational needs in the 1967 MIQ are as follows (in alphabetical order):

1. *Ability Utilization*: I could do something that makes use of my abilities.
2. *Achievement*: The job could give me a feeling of accomplishment.
3. *Activity*: I could be busy all the time.
4. *Advancement*: The job would provide an opportunity for advancement.
5. *Authority*: I could tell people what to do.
6. *Company Policies and Practices*: The company would administer its policies fairly.
7. *Compensation*: My pay would compare well with that of other workers.
8. *Co-workers*: My co-workers would be easy to make friends with.
9. *Creativity*: I could try out some of my own ideas.
10. *Independence*: I could work alone on the job.
11. *Moral Values*: I could do the work without feeling that it is morally wrong.

12. *Recognition*: I could get recognition for the work I do.
13. *Responsibility*: I could make decisions on my own.
14. *Security*: The job would provide for steady employment.
15. *Social Service*: I could do things for other people.
16. *Social Status*: I could be "somebody" in the community.
17. *Supervision — Human Relations*: My boss would back up his men (with top management).
18. *Supervision — Technical*: My boss would train his men well.
19. *Variety*: I could do something different every day.
20. *Working Conditions*: The job would have good working conditions.

The reading difficulty level of these statements is at approximately the fifth grade level as measured by the Flesch formula (Weiss, Dawis, England and Lofquist, 1964a, p. 20).

Each of the twenty statements listed above is paired with every other statement, yielding 190 pairs, each pair constituting an item. Order of presentation of statements for each pair is random. The items are sequenced so that the same statement does not appear in two consecutive items. For these 190 items the individual is asked to choose the statement of the pair which represents the *more important* characteristic of his *ideal* job.

For items 191-210 the individual is asked to indicate whether or not each of the twenty need dimensions is *important* or *not important* in his *ideal* job. Thus, for the first 190 items the individual is asked to make *comparative* judgments, but for the last twenty items he/she is asked to make *absolute* judgments.

The MIQ items are presented in a re-usable booklet. The individual records his responses on a separate answer sheet. A copy of the MIQ instruction page and the first page of items is contained in Appendix A.

## Administration

The MIQ is a self-administering paper-and-pencil instrument which takes about 30-40 minutes to complete. All necessary instructions appear in the booklet. While these instructions are self-explanatory, the psychometrist should insure that the respon-

dent fully understands the instructions. This might be accomplished by asking the individual to explain what the phrase "ideal job" means and by checking to see that the individual is choosing only one answer per item, is responding to the items consecutively and is moving in the right direction (along the rows) on the answer sheet. Furthermore, since the MIQ is a self-report instrument, the psychometrist should encourage the respondent to answer as honestly and frankly as possible.

It is *very* important that the individual make a response for *every* item, even if he must guess. The completed answer sheet should be checked carefully by the psychometrist for unanswered items and the respondent should be asked to complete any unanswered items.

The respondent should be encouraged to respond rapidly to the MIQ items. He should read each item, make a choice, and move quickly to the next item. Since it is assumed that his first reaction to each item likely reflects his true feeling, he should not look back over his answers or change answers once he has marked them on the answer sheet.

Occasionally an individual will complain about the apparent repetitiveness of some of the items. He may feel that the same item pairs are being presented in an attempt to trick him or to determine if he is responding the same way each time. The psychometrist should explain that while the same statement appears many times, no *pair* of statements is repeated. It might even be advisable to mention this fact to the individual before he begins the MIQ.

## Scoring

Basic scoring of the MIQ includes computation of *adjusted scale values* for the twenty vocational need scales, and a *total circular triads* score. In addition, *error bands* are computed around the individual adjusted scale values.

*Adjusted Scale Values.* MIQ adjusted scale values can range from -4.0 to +4.0, with a maximum range for any single individual being half of this total range. Scale values greater than zero indicate needs which are "important" to the individual and those below zero indicate needs which are "unimportant." Each individual's profile is determined solely by his responses to the MIQ rather than by comparison with any normative group. The higher the adjusted scale value, the greater the importance of the vocational need *to that individual*. All scale values are "adjusted" for the individual, that is, computed in such a way that the "zero point" indicates the *same*

subjective point for *all* individuals. (A more detailed explanation of adjusted scale values is found in the Technical Section, pages 29-32).

*Total Circular Triads.* The total circular triads (TCT) score indicates the logical consistency with which an individual has responded to the MIQ items. A circular triad is an intransitive (illogical) sequence of choices which can be described in the following manner:

1. A is chosen over B.
2. B is chosen over C.
3. C is chosen over A.

The circular triad score is used to indicate factors which might invalidate an individual's MIQ profile, such as random responding, response set, lack of familiarity with occupational reinforcers and instability of the individual's vocational needs.

Random responding on the MIQ can occur for several reasons. For example: (a) the individual might not be interested in responding meaningfully to the instrument; (b) the individual might not be able to read well enough to understand the items; or (c) the individual might be suffering from fatigue, boredom, illness or other conditions.

Response sets occur when an individual responds in a fixed pattern which is not related to the item content. He might, for example, mark only the first statement in the pair, or only the second statement in the pair or alternate between them in some systematic manner.

The individual who is unfamiliar with occupational reinforcers, or the individual who has unstable vocational needs may respond to the MIQ in a way that appears to be random. Whatever the cause, such patterns of responding will result in a high TCT score.

A high TCT score indicates an invalid MIQ profile. The TCT score on the MIQ can range from 0 to 385. Scores of 255 or higher represent invalid response to the MIQ.

*Error Bands.* Error bands are computed for each adjusted scale value. Error bands indicate the range of indecision for the respondent on each vocational need dimension measured by the MIQ. In the computation of the error bands, the number of circular triads associated with each scale is counted. If a scale is not involved in any circular triad, there will be no error band for that scale. The error band indicates how an individual's score would change if the circular triads were changed to transitive (logically consistent) choices. (For details of this procedure see the Technical Section, pages 32-35).

*Random Response Patterns.* Invalid MIQ profiles (those with TCT scores of 255 or higher) can be divided into two types — true random and pseudo-random. True random profiles are distinguished from pseudo-random profiles by an analysis of the number of circular triads associated with each of the twenty MIQ scales. If all scales have approximately the same number of circular triads, the resulting profile is considered to be the result of true random responding. If, however, the circular triads are associated with certain scales more than with others, then the profile is considered to be pseudo-random. (Further details of this procedure are reported in the Technical Section, page 35.)

*D<sup>2</sup> Correspondence.* According to the *Theory of Work Adjustment*, an individual's satisfaction in a particular occupation can be predicted from the correspondence between his pattern of vocational needs and the reinforcer system of that occupation. The MIQ profile provides a measure of his vocational needs; Occupational Reinforcer Patterns (ORPs) provide measures of reinforcer systems of occupations. ORPs are currently available for 81 occupations (Borgen et al., 1968a) and the Work Adjustment Project is conducting research to expand the number of available ORPs.

The measure of correspondence used to indicate the correspondence between an individual's MIQ profile and the ORP for a specific occupation is "D-squared" ( $D^2$ ).  $D^2$  is simply the sum of the squared differences between each of the twenty scale values on an individual's MIQ profile and the corresponding scale values on an ORP profile. The lower the  $D^2$  for a given occupation, the greater the similarity between the MIQ profile and the ORP for that occupation. Low  $D^2$  values indicate correspondence, while high  $D^2$  values indicate a relative lack of correspondence. Within the framework of the *Theory of Work Adjustment*, low  $D^2$  values are predictive of satisfaction and high  $D^2$  values, dissatisfaction. (For further details of this procedure see the Technical Section, pages 35-37.)

*Computer Reports.* While it is possible to hand-score the MIQ, it is unfeasible to obtain twenty adjusted scale values and corresponding error bands, a total circular triads score, and  $D^2$ s for the 81 ORPs. Furthermore, hand-scoring of the MIQ is likely to result in many clerical errors because of the complexities of the calculations involved. For these reasons, the Work Adjustment Project has developed a computer scoring service for the MIQ which provides a three-page computer-printed report for each individual.

The circular triads score is printed first. If the TCT is 255 or higher, a statement is printed that the MIQ is invalid and no MIQ profile is printed. The scale-by-scale distribution of circular triads is checked, and if found to be "true random" the following message is printed:

Analysis of the pattern of circular triad data indicates that response to the MIQ was random. This may be the result of one or more of the following:

1. poor motivation
2. carelessness
3. faking
4. response set (patterned response)
5. lack of understanding

If the distribution of circular triads is found to be "pseudo-random" the following message is printed:

Analysis of the pattern of circular triad data indicates that response to the MIQ was non-random. This suggests that this person had difficulty on some (but not all) of the variables being scaled in the MIQ. Re-administration might be appropriate after discussion of the meaning or interpretation of the MIQ items.

This statement is followed by a list of the twenty MIQ scales in descending order of number of circular triads associated with each scale. The scale with the largest number of circular triads is the scale the respondent had the most trouble evaluating, the scale with the next largest number of circular triads is the one he had the next most difficulty in evaluating, and so on down to the scale with the lowest number of associated circular triads, which is the scale the individual was most consistent in evaluating. Figure 1 shows a sample computer report for a "pseudo-random" response pattern. The circular triads associated with each scale are called Stimulus Circular Triads (SCT). Since three statements are contained in each circular triad relationship, the number of SCT across the twenty MIQ scales equals three times the TCT score. (Further information can be found in the Technical Section, pages 32-37.) For "pseudo-random" profiles, re-administration of the MIQ may be indicated after clarifying to the respondent the meaning of scales with high SCTs.

For those individuals with a TCT score lower than 255, a profile of MIQ adjusted scale values and the  $D^2$  correspondence indices for 81 occupation ORPs and nine cluster ORPs are printed. The MIQ profile contains the twenty vocational need scales followed by the

# Figure 1

## Sample Computer Report for a Pseudo-Random Response Pattern

REPORT ON THE MINNESOTA IMPORTANCE QUESTIONNAIRE  
(MIQ)  
1967 REVISION

NAME--SAMPLE REPORT PSEUDO-RANDOM

CIRCULAR TRIAD SCORE= 263

INVALID RESPONSE RANGE BEGINS AT 255

\*\*\*\*\* MINNESOTA IMPORTANCE QUESTIONNAIRE IS INVALID \*\*\*\*\*

ANALYSIS OF THE PATTERN OF CIRCULAR TRIAD DATA INDICATES THAT RESPONSE TO THE MIQ WAS NON-RANDOM.

THIS SUGGESTS THAT THIS PERSON HAD DIFFICULTY ON SOME  
(BUT NOT ALL) OF THE VARIABLES BEING SCALED IN THE MIQ.  
RE-ADMINISTRATION MIGHT BE APPROPRIATE AFTER DISCUSSION OF  
THE MEANING OR INTERPRETATION OF THE MIQ ITEMS

LISTED BELOW ARE THE 20 MIQ VOCATIONAL NEED SCALES IN  
DECREASING ORDER OF THEIR ASSOCIATED STIMULUS CIRCULAR TRIADS (SCT).  
THE SCALES AT THE TOP OF THE LIST REPRESENT THOSE NEEDS  
WHICH THE RESPONDENT HAD THE MOST DIFFICULTY JUDGING, AND THOSE  
AT THE BOTTOM REPRESENT THOSE NEEDS WHICH THE RESPONDENT COULD  
JUDGE MOST CONSISTENTLY.

MIQ SCALE	SCT	MIQ SCALE	SCT
COMPANY POLICIES AND PRACTICES	49	CREATIVITY .....	39
VARIETY .....	47	SOCIAL SERVICE .....	39
COMPENSATION .....	46	WORKING CONDITIONS .....	35
INDEPENDENCE .....	45	SOCIAL STATUS .....	34
RESPONSIBILITY .....	44	ABILITY UTILIZATION .....	33
MORAL VALUES .....	43	SECURITY .....	33
SUPERVISION--HUMAN RELATIONS	43	ADVANCEMENT .....	33
COWORKERS .....	42	AUTHORITY .....	31
RECOGNITION .....	42	ACHIEVEMENT .....	28
ACTIVITY .....	41	SUPERVISION--TECHNICAL .....	25

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adjusted scale values. A numerical scale (ranging from -4 to +4) is printed at the top and bottom of each individual's profile and an X is printed on the profile to indicate the adjusted scale value for each scale. The X is flanked by a number of dashes (—) if an error band (defined by the Stimulus Circular Triads associated with that scale) is present for that scale. Numerical values for the error band around the individual's obtained adjusted scale value can be read from the numerical scale at the top or bottom of the profile.

The zero point for each person is located in the center of the profile. Positive adjusted scale values, indicating important vocational needs, are plotted to the right of the zero point, and negative scale values (non-important needs), to the left of the zero point. Adjusted scale values above 1.5 are considered "high." These values indicate needs which are very important to the individual. Adjusted scale values which are between 1.0 and 1.5 indicate "moderate" needs. Both high and moderate scale values should be carefully considered. Adjusted scale values between 0 and +0.3 indicate "low" importance and scale values below 0 are of "very low" importance. These guidelines are shown on MIQ profiles by dotted, vertical lines at 0.3, 1.0, and 1.5.

The MIQ scale values represent the individual's scaling of his reinforcer preferences for his ideal job environment *without reference to anyone else*. The adjusted scale values represent distances from the individual's *own* zero point. Thus the scale values are unique to the individual and need not be compared with the scale values of others for the purpose of interpretation.

On occasion it may be appropriate to compare an individual's scores with scores of some reference group, as would be the case if the counselor wished to find out whether an individual's preferences were "typical" of some group of which he is a member e.g., rehabilitation clients. For this purpose, percentile conversions of MIQ adjusted scale values and TCT scores are provided for several groups in Appendix B.

On the second and third pages of the computer report,  $D^2$ 's are given for the 81 occupations arranged in decreasing order of correspondence (as  $D^2$  increases, correspondence decreases). Job title is given, followed by a number identifying the ORP cluster of the job, the  $D^2$  index of correspondence and a prediction of the level of satisfaction the individual is likely to achieve in the occupation. Work Adjustment Project research plans include expanding the number of available ORPs and improving the format for presenting



correspondence indices as well as the measurement of correspondence itself.

The same listing is provided for the nine ORP clusters with the exclusion of a prediction of satisfaction. Each cluster is simply a family of occupations with similar ORPs. These clusters allow the counselor to generalize in a meaningful way beyond the 81 specific occupations. (Further details on the ORPs and the development of the occupational ORPs and ORP clusters can be found in Borgen et al., 1968a,b).

In using the  $D^2$  correspondence measure, the vocational counselor should be concerned with the relative ranking and absolute size of  $D^2$  values for the occupations listed on the MIQ computer report. The  $D^2$  measure is related to probable satisfaction in an occupation (Betz, 1969). Thus, the lower the  $D^2$  for the ORP of a particular occupation, the more likely is the individual to be satisfied in that occupation. Occupations with larger  $D^2$  values are those in which the individual is less likely to be satisfied, since his pattern of preferences (needs) is less similar to the pattern of reinforcers (ORPs) in the occupation.

Based on an examination of the distribution of  $D^2$  values (using the correspondence between the individual's MIQ profile and the ORP of the occupation in which he was currently employed) for individuals in five different occupations<sup>1</sup>, the following guidelines for interpreting  $D^2$  are suggested:

- 1) A  $D^2$  of less than 9.00 suggests that the individual *would be satisfied* in the occupation.
- 2) A  $D^2$  of greater than 9.00 but less than 20.00 suggests that the individual is *likely to be satisfied* in the occupation; and
- 3) A  $D^2$  of greater than 20.00 suggests that the individual is *not likely to be satisfied* in the occupation.

### Interpretation of the MIQ

As the preceding section on Scoring indicates, interpretation of the MIQ can occur at many levels. The following summary might be useful to the reader:

---

<sup>1</sup> The guidelines are based on the fact that not more than 25% of the workers in these "own occupations" had  $D^2$ 's of greater than 20.00, while almost 25% of them had a  $D^2$  less than 9.00. These guidelines are used in determining the prediction of satisfaction which is printed on the computer report.

1. The MIQ is a *self-report* instrument and therefore its validity depends to a significant extent on the full cooperation of the responding individual.
2. On the MIQ, the individual reports his vocational needs, that is, his *preferences for occupational reinforcers*. The structure (format and scoring system) of the MIQ is designed to facilitate the *meaningful* reporting of such preferences.
3. The *adjusted scale values* indicate the level of importance of the individual's reinforcer preferences, with reference to his own zero point (no preference one way or the other). An adjusted scale value of *1.5 or higher* indicates a reinforcer of *high* importance to the individual. An adjusted scale value of *1.0 to 1.5* indicates a reinforcer of *moderate* importance, a value of *0.0 to 0.3* is of *low* importance and a value *below 0.0* is of *very low* importance.
4. A *circular triad score* of *255 or higher* indicates an *invalid* MIQ profile that may be due to *true random* responding or to *pseudo-random* responding. In the case of the latter, the computer report will show the *stimulus circular triad scores* which indicate which scales (statements about reinforcers) are causing difficulty for the individual.
5. The *error bands* (dashes on both sides of the adjusted scale values) indicate the extremes to which the scale value could move *if* the individual were completely logically consistent (transitive) in his responses to the MIQ.
6.  $D^2$  indicates the similarity between the individual's reinforcer preferences (MIQ vocational needs profile) and the reinforcer pattern of the occupation (ORP). A  $D^2$  of *9.00 or less* indicates a high degree of similarity or *correspondence*, for which *satisfaction* with the occupation is predicted. A  $D^2$  higher than *9.00 but less than 20.00* indicates that *satisfaction is likely* and a  $D^2$  of *20.00 or greater* indicates that *satisfaction is unlikely*.

The vocational rehabilitation counselor is cautioned not to misinterpret the  $D^2$  index. While  $D^2$  helps to predict an individual's satisfaction in an occupation, it is *not intended* to be used to predict his *satisfactoriness* (e.g., his job performance or a rating by his superiors). Satisfactoriness is predicted from the correspondence of an individual's vocational abilities and the ability requirements of an occupation.

An individual may be a satisfactory employee and still not be satisfied with his job. On the other hand, there are individuals who may be satisfied with their jobs, but are unsatisfactory employees. The vocational rehabilitation counselor should communicate very clearly to the counselee that D<sup>2</sup> (MIQ-ORP correspondence) relates to *job satisfaction*, but not job satisfactoriness.

Given predictions of satisfactoriness derived from ability-ability requirements correspondence, the vocational rehabilitation counselor can then use the MIQ to narrow the range of job possibilities for a counselee with a view to maximizing the counselee's probable satisfaction. Alternatively, the MIQ can be used to determine those occupations for which the individual is predicted to be satisfied, and then the range of occupational possibilities can be narrowed by considering the counselee's predicted satisfactoriness. Of course, other important factors such as training requirements, availability of training and the financial cost of training in light of the counselee's other responsibilities, should also be considered.

### Interpretation of Scale Content

In the absence of data based on extensive counseling use of the MIQ, a high scale value on the MIQ may be interpreted at face value as signifying a preference for the specific reinforcer represented by the scale, or as indicating preference for a more general reinforcer for which the scale is one of several indicators. With respect to the latter interpretation, six general reinforcers have been identified by factor analysis as underlying the twenty MIQ scales (see Technical Section, pages 41-46). These are listed below, together with the scales which can be interpreted as indicators of the six general reinforcers:

#### I. Management

- a. Supervision — Human Relations
- b. Supervision — Technical
- c. Company Policies and Practices
- d. Compensation
- e. Working Conditions
- f. Security

#### II. Autonomy

- a. Responsibility
- b. Creativity
- c. Authority

### III. Conditions of Work

- a. Activity
- b. Independence
- c. Variety
- d. Security
- e. Working Conditions

### IV. Altruism

- a. Social Service
- b. Moral Values
- c. Co-workers

### V. Achievement

- a. Ability Utilization
- b. Achievement
- c. Advancement

### VI. Recognition

- a. Social Status
- b. Recognition
- c. Authority

By examining the pattern of high scale values, one might be able to discern which of these six general reinforcers might be preferred by the MIQ respondent. Interpretation on this basis (general reinforcers) might then be confirmed by interview or personal history data.

In interpretation of the MIQ profile, the scale titles cannot be interpreted completely without reference to the specific content of the item representing a given scale. As examples, the Social Status scale is represented by the item "I could be 'somebody' in the community," and the Independence scale, by the item "I could work alone on the job." The individual, in responding to the MIQ, is presented with the items rather than the scale titles themselves. Scale values on the MIQ represent the individual's preference for the specific reinforcer represented by the item. Interpretation on this basis may avoid some difficulties in the interpretation of some MIQ scales with a given individual.

## Sample Profiles

*Typical MIQ Profiles.* Figures 2 and 3 show typical MIQ profiles (but for fictitious individuals).

The first page of the report shows the MIQ profile. The total circular triad score is printed in the upper left-hand corner of the page. John Johnson (Figure 2) obtained 52 circular triads, which is well below the cut-off value of 255 for invalid profiles. This fact is indicated by the statement "MIQ is valid."

The twenty MIQ scales are listed in alphabetical order on the left-hand side of the profile. The next column shows John's adjusted scale values for each scale. To the right of this column, the scale values are plotted, with the values indicated by X's and dashes on both sides of the X's indicating the error bands.

John's highest adjusted scale value was 2.6 on the Working Conditions scale, followed by Security with a scale value of 2.1, and Social Service with a scale value of 1.6. All of these scale values are in the "high importance" range. The Working Conditions and Security scale values have no error bands. This means that John was consistent in his preferences for these two reinforcers. For Social Service the error band extends to a scale value of 1.8, meaning that were John logically consistent, Social Service could have an adjusted scale value as high as 1.8.

Five scale values are in the "moderately important" range, with four having error bands that extend into the "high importance" range. For these four scales, Achievement, Advancement, Compensation, and Creativity, the error bands indicate that the "true" scale values might be as high as 1.6 for all four scales, as low as 1.1 for Achievement, Compensation and Creativity and as low as 0.8 for Advancement.

John obtained adjusted scale values in the "very low" range of importance for Social Status (-1.4), Authority (-.9) and Moral Values (-.4) while Independence, Supervision—Human Relations, and Supervision—Technical (all with scale values of .1) were in the "low" importance range.

In summary, John Johnson's MIQ profile is characterized by preferences for Working Conditions, Security and Social Service as "highly important" reinforcers, while Social Status, Authority and Moral Values are reinforcers of "very low" importance to him.

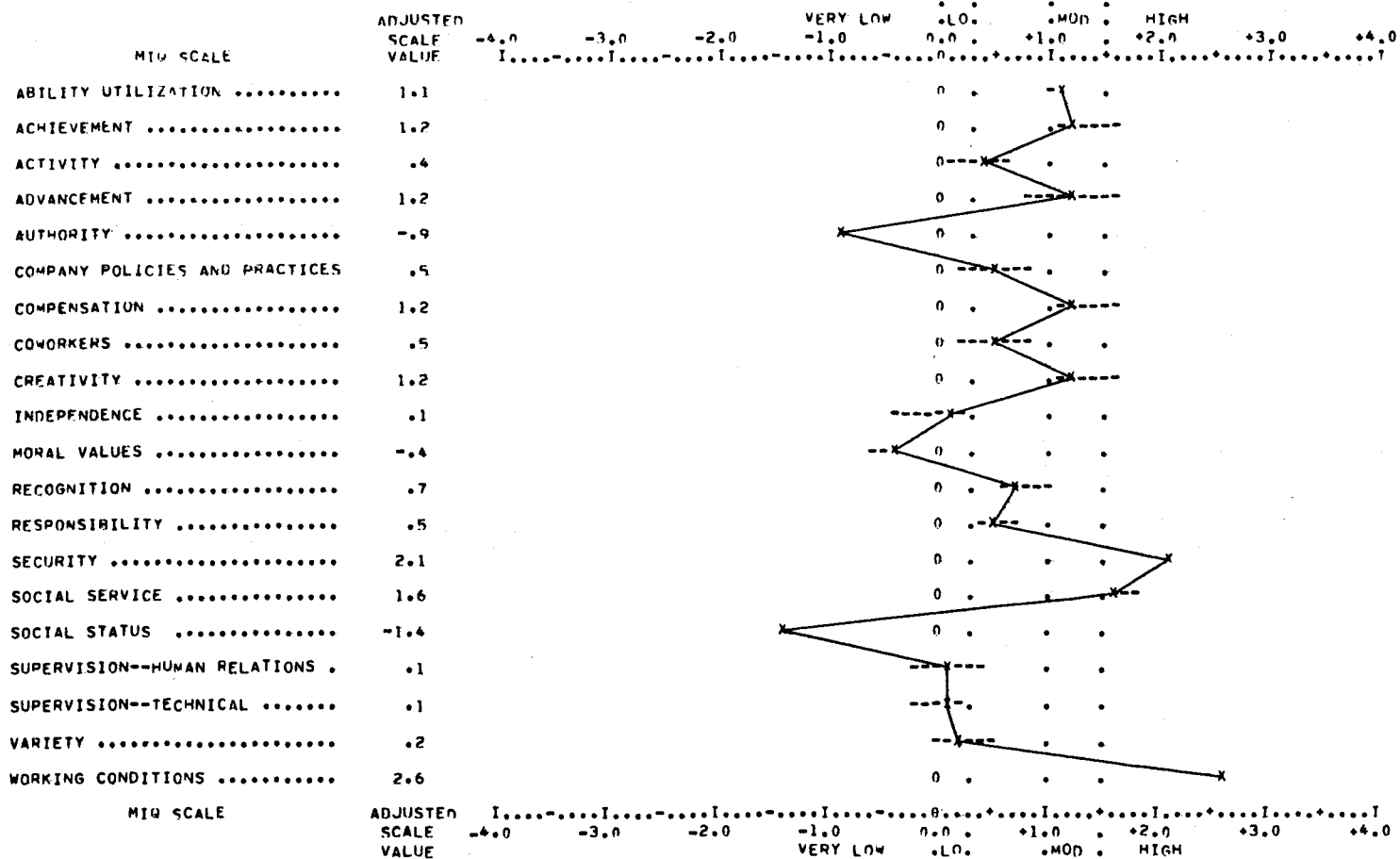
Pages 2 and 3 of the MIQ computer report show the  $D^2$  values for the 81 occupations and the nine occupational clusters for which

**Figure 2**  
**First Page of MIQ Computer Report for John Johnson**

NAME--JOHN JOHNSON

REPORT ON THE MINNESOTA IMPORTANCE QUESTIONNAIRE  
(MIQ)  
1967 REVISION

CIRCULAR TOTAL SCORE= 52  
INVALID RESPONSE RANGE  
BEGINN AT 255.  
MIQ IS VALID.



## Figure 2 (continued)

### Second Page of MIQ Computer Report for John Johnson

CORRESPONDENCE BETWEEN OCCUPATIONAL REINFORCER PATTERNS AND MIQ SCALE VALUES FOR JOHN JOHNSON

#1 OCCUPATIONS LISTED IN DECREASING ORDER OF CORRESPONDENCE, USING D-SQUARED INDEX.  
OCCUPATIONS AT THE TOP OF THIS LIST ARE THOSE IN WHICH THIS INDIVIDUAL IS MOST LIKELY TO BE SATISFIED.  
OCCUPATIONS AT THE BOTTOM OF THE LIST ARE THOSE IN WHICH HE(SHE) IS LEAST LIKELY TO BE SATISFIED.

OCCUPATION	CLUSTER	D-SQUARED	PREDICTION OF SATISFACTION
ENTER, TECHNICAL PUBLICATIONS	2	8.82	SATISFIED
PHOTOENGRAVER (STRIPPER)	9	8.89	SATISFIED
DRAFTSMAN, ARCHITECTURAL	9	9.02	LIKELY SATISFIED
STENOGRAPHER, TECHNICAL, CIVIL SERVICE	5	9.04	LIKELY SATISFIED
SALESPERSON, SHOE	-	9.39	LIKELY SATISFIED
ACCOUNTING CLERK, MANUFACTURING	8	9.67	LIKELY SATISFIED
MACHINIST	9	9.72	LIKELY SATISFIED
SHEET METAL WORKER	9	9.82	LIKELY SATISFIED
TYPIST, CIVIL SERVICE	5	9.94	LIKELY SATISFIED
ELECTRONICS MECHANIC	9	10.04	LIKELY SATISFIED
RECEPTIONIST, CIVIL SERVICE	-	10.08	LIKELY SATISFIED
SALESPERSON, GENERAL (DEPARTMENT STORE)	-	10.15	LIKELY SATISFIED
ELECTRICAL TECHNICIAN	9	10.20	LIKELY SATISFIED
ASSEMBLER, SMALL PARTS	8	10.25	LIKELY SATISFIED
WATER-WAITRESS	6	10.29	LIKELY SATISFIED
TELEVISION SERVICE-AND-REPAIRMAN	9	10.39	LIKELY SATISFIED
COOK (HOTEL-RESTAURANT)	-	10.40	LIKELY SATISFIED
MAINTENANCE MAN, FACTORY OR MILL	9	10.42	LIKELY SATISFIED
ELECTRICIAN	9	10.42	LIKELY SATISFIED
ACCOUNTANT, COST	2	10.47	LIKELY SATISFIED
PROGRAMMER (BUSINESS, ENGINEERING AND SCIENCE)	2	10.51	LIKELY SATISFIED
STATISTICIAN, APPLIED	2	10.61	LIKELY SATISFIED
SALESMAN-DRIVER	-	10.63	LIKELY SATISFIED
ACCOUNTING CLERK, CIVIL SERVICE	5	10.70	LIKELY SATISFIED
MEDICAL TECHNOLOGIST	6	10.79	LIKELY SATISFIED
BEAUTY OPERATOR	3	10.84	LIKELY SATISFIED
WELDER, COMBINATION	9	10.90	LIKELY SATISFIED
PRODUCTION HELPER (FOOD)	8	10.93	LIKELY SATISFIED
AUTOMOBILE-BODY REPAIRMAN	9	11.08	LIKELY SATISFIED
RADIOLOGIC TECHNOLOGIST	6	11.19	LIKELY SATISFIED
PHYSICAL THERAPIST	4	11.29	LIKELY SATISFIED
SCREW-MACHINE OPERATOR, PRODUCTION	9	11.32	LIKELY SATISFIED
MARKER	8	11.38	LIKELY SATISFIED
PUNCH-PRESS OPERATOR	8	11.43	LIKELY SATISFIED
ENGINEER, STATIONARY	-	11.44	LIKELY SATISFIED
SALESMAN, AUTOMOBILE	-	11.47	LIKELY SATISFIED
LEAT CUTTER	8	11.56	LIKELY SATISFIED
AUTOMOBILE SERVICE STATION ATTENDANT	5	11.58	LIKELY SATISFIED
AUTOMOBILE MECHANIC	9	11.61	LIKELY SATISFIED
BARBER	6	11.63	LIKELY SATISFIED
TELLER (BANKING)	-	11.71	LIKELY SATISFIED
PIPEFITTER	7	11.83	LIKELY SATISFIED
COMMERCIAL ARTIST, ILLUSTRATING	-	11.90	LIKELY SATISFIED
PAINTER/PAPERHANGER	7	11.91	LIKELY SATISFIED
OFFICE-MACHINE SERVICEMAN	9	11.94	LIKELY SATISFIED

--CONTINUED ON THE NEXT PAGE--

**Figure 2 (continued)**  
**Third Page of MIQ Computer Report for John Johnson**

OCCUPATIONS--CONTINUED

JOHN JOHNSON

LIBRARIAN	4	11.99	LIKELY SATISFIED
CLAIM ADJUSTER	-	12.21	LIKELY SATISFIED
TRUCK DRIVER	-	12.22	LIKELY SATISFIED
BAKER	8	12.24	LIKELY SATISFIED
ASSEMBLER (ELECTRICAL EQUIPMENT)	8	12.53	LIKELY SATISFIED
OCCUPATIONAL THERAPIST	4	12.54	LIKELY SATISFIED
CARPENTER	7	12.56	LIKELY SATISFIED
NURSE AID	6	12.59	LIKELY SATISFIED
CASHIER-CHECKER	-	12.66	LIKELY SATISFIED
CLERK, GENERAL OFFICE, CIVIL SERVICE	5	12.74	LIKELY SATISFIED
BARTENDER	-	12.74	LIKELY SATISFIED
PLUMBER	-	12.89	LIKELY SATISFIED
TEACHER, SECONDARY SCHOOL	4	13.03	LIKELY SATISFIED
PLUMBER	7	13.07	LIKELY SATISFIED
PAINTER	4	13.15	LIKELY SATISFIED
NURSE, LICENSED PRACTICAL	6	13.17	LIKELY SATISFIED
AIRPLANE STEWARDESS	-	13.19	LIKELY SATISFIED
CLAIM EXAMINER	-	13.27	LIKELY SATISFIED
HEAVY EQUIPMENT OPERATOR (CONSTRUCTION)	7	13.28	LIKELY SATISFIED
PHARMACIST	-	13.37	LIKELY SATISFIED
ENGINEER, TIME STUDY	1	13.66	LIKELY SATISFIED
ENGINEER, MECHANICAL	1	13.73	LIKELY SATISFIED
ENGINEER, CIVIL	1	13.88	LIKELY SATISFIED
SALESMAN, REAL ESTATE	3	13.96	LIKELY SATISFIED
COUNSELOR, VOCATIONAL REHABILITATION	4	14.21	LIKELY SATISFIED
INSTRUCTOR, VOCATIONAL SCHOOL	4	14.25	LIKELY SATISFIED
FIRE FIGHTER	-	14.69	LIKELY SATISFIED
TEACHER, ELEMENTARY SCHOOL	4	14.76	LIKELY SATISFIED
SEWING-MACHINE OPERATOR, AUTOMATIC	8	14.81	LIKELY SATISFIED
BUS DRIVER	-	14.94	LIKELY SATISFIED
COURSE, PROFESSIONAL	-	15.04	LIKELY SATISFIED
COUNSELOR, SCHOOL	4	15.76	LIKELY SATISFIED
POLICEMAN	-	16.48	LIKELY SATISFIED
DR. ERLY	6	16.50	LIKELY SATISFIED
SALESMAN, SECURITIES	3	17.54	LIKELY SATISFIED
LANDSCAPE GARDENER	-	18.00	LIKELY SATISFIED

9 OCCUPATIONAL FAMILIES LISTED IN DECREASING ORDER OF CORRESPONDENCE, USING D-SQUARED INDEX

CLUSTER 1 -- MANUAL OCCUPATIONS, SERVICE-MAINTENANCE	9.70
CLUSTER 2 -- TECHNICAL OCCUPATIONS, SEMI-PROFESSIONAL	9.84
CLUSTER 4 -- SERVICE OCCUPATIONS, BUSINESS DETAIL	10.83
CLUSTER 8 -- MANUAL OCCUPATIONS, MANUFACTURING	11.10
CLUSTER 2 -- SERVICE OCCUPATIONS, PERSONAL	11.12
CLUSTER 7 -- MANUAL OCCUPATIONS, BUILDING TRADES	12.11
CLUSTER 4 -- SERVICE OCCUPATIONS, SOCIAL-EDUCATIONAL	12.95
CLUSTER 3 -- SALES OCCUPATIONS, SERVICE	13.24
CLUSTER 1 -- TECHNICAL OCCUPATIONS, PROFESSIONAL	13.39

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ORPs are available. The occupations are listed from the lowest  $D^2$  (greatest correspondence between MIQ and ORP) to the highest  $D^2$  value. John's listing of occupations shows his preferences to be most similar to the occupations of Writer, Technical Publications (with a  $D$ -squared value of 8.82) and Photoengraver with a  $D^2$  value of 8.89). The ORP for Writer, Technical Publications (Borgen et al., 1968a, pp. 178-179) shows that John's two highest scales, Security and Working Conditions, are "moderately descriptive" of that occupation, while the two scales rated "very low" by John, Authority and Social Status, are "not descriptive" of the occupation. The ORP for Writer, Technical Publications also has several scales in the "moderate" and "high" ranges (Creativity, Advancement, Achievement and Ability Utilization) which are also in John's "moderate" to "high" range. The major discrepancy between John's MIQ profile and the ORP for Writer, Technical Publications is that Social Service is of "high importance" to John but below the "moderate" range for Writer, Technical Publications.

ORPs for other occupations high on John's list may be examined in the manner illustrated above, comparing John's salient preferences and the salient reinforcer characteristics of the occupation. From such consideration, the vocational rehabilitation counselor can help his client choose an occupation or career from those most likely to maximize his satisfaction. In John's case the counselor has an advantage since John's vocational needs coincide with the reinforcer characteristics of many jobs.

At the bottom of the last page of the report the  $D^2$  values are given for the nine ORP clusters. These are also ranked in order of increasing  $D^2$  values. For John, Manual Occupations, Service-Maintenance (Cluster 9) and Technical Occupations, Semi-Professional (Cluster 2) have the lowest  $D^2$ s while Technical Occupations, Professional (Cluster 1) and Sales Occupations, Service (Cluster 3) have the highest  $D^2$ s. The specific occupations in the cluster can be identified by the cluster numbers printed following the 81 occupations.

Figure 3 shows an MIQ profile for another fictitious individual, Howard Anthony.

Howard's TCT score of 79 is well below the 255 cut-off for invalid profiles. The statement "MIQ is valid" is printed and the full report follows.

Howard's four highest adjusted scale values fall in the "high" importance range (Achievement, 2.8; Ability Utilization, 2.3; Ad-

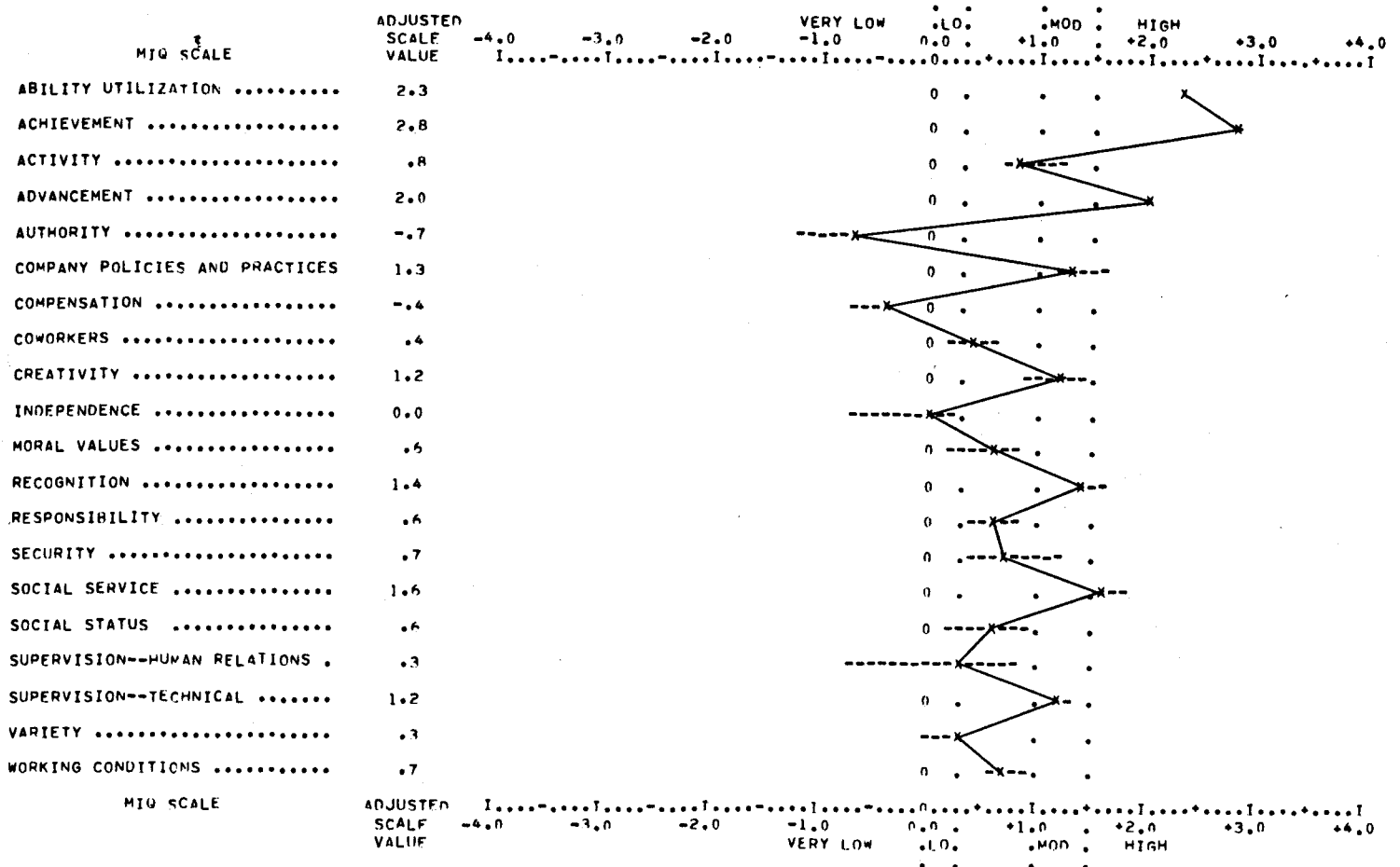
# Figure 3

## First Page of MIQ Computer Report for Howard Anthony

REPORT ON THE MINNESOTA IMPORTANCE QUESTIONNAIRE  
(MIQ)  
1967 REVISION

NAME--HOWARD ANTHONY

CIRCULAR TRIAD SCORE= 79  
INVALID RESPONSE RANGE  
BEGINS AT 255.  
MIQ IS VALID.



**Figure 3 (continued)**  
**Second Page of MIQ Computer Report for Howard Anthony**

CORRESPONDENCE BETWEEN OCCUPATIONAL REINFORCER PATTERNS AND MIQ SCALE VALUES FOR HOWARD ANTHONY

81 OCCUPATIONS LISTED IN DECREASING ORDER OF CORRESPONDENCE, USING D-SQUARED INDEX.  
 OCCUPATIONS AT THE TOP OF THIS LIST ARE THOSE IN WHICH THIS INDIVIDUAL IS MOST LIKELY TO BE SATISFIED.  
 OCCUPATIONS AT THE BOTTOM OF THE LIST ARE THOSE IN WHICH HE(SHE) IS LEAST LIKELY TO BE SATISFIED.

OCCUPATION	CLUSTER	D-SQUARED	PREDICTION OF SATISFACTION
WRITER, TECHNICAL PUBLICATIONS	2	7.39	SATISFIED
CASEWORKER	4	7.61	SATISFIED
INSTRUCTOR, VOCATIONAL SCHOOL	4	7.79	SATISFIED
PROGRAMMER (BUSINESS, ENGINEERING AND SCIENCE)	2	8.03	SATISFIED
TEACHER, ELEMENTARY SCHOOL	4	8.40	SATISFIED
COUNSELOR, VOCATIONAL REHABILITATION	4	8.60	SATISFIED
PHYSICAL THERAPIST	4	8.71	SATISFIED
DRAFTSMAN, ARCHITECTURAL	9	8.95	SATISFIED
BEAUTY OPERATOR	3	8.96	SATISFIED
STATISTICIAN, APPLIED	2	9.07	LIKELY SATISFIED
ENGINEER, TIME STUDY	1	9.12	LIKELY SATISFIED
ACCOUNTANT, COST	2	9.14	LIKELY SATISFIED
TELEVISION SERVICE-AND-REPAIRMAN	9	9.18	LIKELY SATISFIED
LIBRARIAN	4	9.24	LIKELY SATISFIED
TEACHER, SECONDARY SCHOOL	4	9.26	LIKELY SATISFIED
ELECTRICAL TECHNICIAN	9	9.33	LIKELY SATISFIED
ELECTRICIAN	9	9.40	LIKELY SATISFIED
SHEET METAL WORKER	9	9.50	LIKELY SATISFIED
COMMERCIAL ARTIST, ILLUSTRATING	-	9.76	LIKELY SATISFIED
ENGINEER, CIVIL	1	9.76	LIKELY SATISFIED
CLAIM ADJUSTER	-	9.84	LIKELY SATISFIED
SCREW-MACHINE OPERATOR, PRODUCTION	9	9.99	LIKELY SATISFIED
OCCUPATIONAL THERAPIST	4	10.03	LIKELY SATISFIED
SALESPERSON, GENERAL (DEPARTMENT STORE)	-	10.14	LIKELY SATISFIED
COOK (HOTEL-RESTAURANT)	-	10.23	LIKELY SATISFIED
SALESPERSON, SHOE	-	10.41	LIKELY SATISFIED
ELECTRONICS MECHANIC	9	10.47	LIKELY SATISFIED
NURSE, PROFESSIONAL	-	10.47	LIKELY SATISFIED
ENGINEER, MECHANICAL	1	10.48	LIKELY SATISFIED
SALESMAN, REAL ESTATE	3	10.84	LIKELY SATISFIED
SALESMAN, SECURITIES	3	10.87	LIKELY SATISFIED
COUNSELOR, SCHOOL	4	10.96	LIKELY SATISFIED
OFFICE-MACHINE SERVICEMAN	9	10.98	LIKELY SATISFIED
EMERALMER	6	11.08	LIKELY SATISFIED
MAINTENANCE MAN, FACTORY OR MILL	9	11.13	LIKELY SATISFIED
CARPENTER	7	11.29	LIKELY SATISFIED
SALESMAN, AUTOMOBILE	-	11.37	LIKELY SATISFIED
MACHINIST	9	11.51	LIKELY SATISFIED
WELDER, COMBINATION	9	11.82	LIKELY SATISFIED
AUTOMOBILE MECHANIC	9	11.84	LIKELY SATISFIED
CLAIM EXAMINER	-	11.91	LIKELY SATISFIED
ACCOUNTING CLERK, CIVIL SERVICE	5	12.04	LIKELY SATISFIED
PLUMBER	7	12.07	LIKELY SATISFIED
RADIOLOGIC TECHNOLOGIST	6	12.31	LIKELY SATISFIED
DIETITIAN	-	12.57	LIKELY SATISFIED

--CONTINUED ON THE NEXT PAGE--

# Figure 3 (continued)

## Third Page of MIQ Computer Report for Howard Anthony

### OCCUPATIONS--CONTINUED

### HOWARD ANTHONY

AUTOMOBILE-BODY REPAIRMAN	9	12.62	LIKELY SATISFIED
PAINTER/PAPERHANGER	7	12.81	LIKELY SATISFIED
NURSE, LICENSED PRACTICAL	6	12.85	LIKELY SATISFIED
PHOTOENGRAVER(STRIPPER)	9	13.13	LIKELY SATISFIED
POLICEMAN	-	13.13	LIKELY SATISFIED
SALESMAN-DRIVER	-	13.15	LIKELY SATISFIED
MEDICAL TECHNOLOGIST	6	13.56	LIKELY SATISFIED
ENGINEER, STATIONARY	-	13.58	LIKELY SATISFIED
RECEPTIONIST, CIVIL SERVICE	-	13.61	LIKELY SATISFIED
AUTOMOBILE SERVICE STATION ATTENDANT	5	13.74	LIKELY SATISFIED
PIPEFITTER	7	14.03	LIKELY SATISFIED
MARKER	8	14.26	LIKELY SATISFIED
HEAVY EQUIPMENT OPERATOR(CONSTRUCTION)	7	14.28	LIKELY SATISFIED
ACCOUNTING CLERK, MANUFACTURING	8	14.33	LIKELY SATISFIED
TYPIST, CIVIL SERVICE	5	14.38	LIKELY SATISFIED
AIRPLANE STEWARDESS	-	14.41	LIKELY SATISFIED
ASSEMBLER, SMALL PARTS	8	14.60	LIKELY SATISFIED
PRODUCTION HELPER (FOOD)	8	14.68	LIKELY SATISFIED
STENOGRAPHER, TECHNICAL, CIVIL SERVICE	5	14.83	LIKELY SATISFIED
CLERK, GENERAL OFFICE, CIVIL SERVICE	5	15.50	LIKELY SATISFIED
BAKER	8	15.50	LIKELY SATISFIED
PHARMACIST	-	15.50	LIKELY SATISFIED
LANDSCAPE GARDENER	-	15.52	LIKELY SATISFIED
FIRE FIGHTER	-	15.56	LIKELY SATISFIED
TELLER (BANKING)	-	16.30	LIKELY SATISFIED
NURSE AID	6	16.57	LIKELY SATISFIED
PUNCH-PRESS OPERATOR	8	16.88	LIKELY SATISFIED
SEWING-MACHINE OPERATOR, AUTOMATIC	8	17.09	LIKELY SATISFIED
BUS DRIVER	-	17.29	LIKELY SATISFIED
BARTENDER	-	18.13	LIKELY SATISFIED
WAITER-WAITRESS	6	18.55	LIKELY SATISFIED
MEAT CUTTER	8	18.92	LIKELY SATISFIED
ASSEMBLER(ELECTRICAL EQUIPMENT)	8	18.94	LIKELY SATISFIED
CASHIER-CHECKER	-	19.64	LIKELY SATISFIED
TRUCK DRIVER	-	21.98	NOT LIKELY SATISFIED
ORDERLY	6	24.65	NOT LIKELY SATISFIED

### 9 OCCUPATIONAL FAMILIES LISTED IN DECREASING ORDER OF CORRESPONDENCE, USING D-SQUARED INDEX

CLUSTER 4 -- SERVICE OCCUPATIONS, SOCIAL-EDUCATIONAL	8.13
CLUSTER 2 -- TECHNICAL OCCUPATIONS, SEMI-PROFESSIONAL	8.13
CLUSTER 3 -- SALES OCCUPATIONS, SERVICE	9.34
CLUSTER 1 -- TECHNICAL OCCUPATIONS, PROFESSIONAL	9.48
CLUSTER 9 -- MANUAL OCCUPATIONS, SERVICE-MAINTENANCE	10.04
CLUSTER 7 -- MANUAL OCCUPATIONS, BUILDING TRADES	12.34
CLUSTER 5 -- SERVICE OCCUPATIONS, BUSINESS DETAIL	13.80
CLUSTER 6 -- SERVICE OCCUPATIONS, PERSONAL	14.38
CLUSTER 8 -- MANUAL OCCUPATIONS, MANUFACTURING	15.60

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vancement, 2.0; and Social Service, 1.6). The three highest scale values have no circular triads associated with them, indicating that Howard was completely consistent in his ranking of these reinforcers. For Social Service, however, Howard's "true" scale value could range from 1.6 to 1.8.

Howard has two scale values which are in the "very low" range: Authority (-.7) and Compensation (-.4). Independence and Supervision—Human Relations have error bands which extend into the "very low" category.

The error band for Supervision—Human Relations is the widest among all the twenty scales, ranging from -.7 to .8. This means that Howard had his greatest difficulty in consistently rating the statement "My boss would back up his men (with top management)."

In summary, Howard Anthony's MIQ profile is characterized by strong preference for Achievement, Ability Utilization, Advancement and Social Service, and low preference for Authority and Compensation.

On the listing of  $D^2$  values, prediction of satisfaction for Howard was obtained for nine occupations. Five of these occupations belong to Cluster 4—Service Occupations, Social-Educational which is also the cluster with the lowest  $D^2$ . Two of the nine occupations belong in Cluster 2—Technical Occupations, Semi-Professional, the cluster with the second lowest  $D^2$ . These are occupational groups that should be explored first in vocational counseling with Howard.

In general, Howard's profile shows more variability in  $D^2$ 's than John's. He had more occupations in the predicted "satisfied" category and two in the predicted "not likely satisfied" category compared with none for John.

*Some Atypical MIQ Profiles.* Figure 4 is an example of an extremely low profile. A profile like this will result if the individual answers "no" to all the absolute judgment items (items 191-210). When this happens, all scale values are zero or below, and consequently all  $D^2$  values are extremely high. (In this particular case, the lowest  $D^2$  value was 52.92.) Such a result could mean that the MIQ is invalid for the individual (i.e., it does not contain any of his preferred occupational reinforcers) or that the individual was responding invalidly.

Figure 5 illustrates an extremely high MIQ profile which has a large number of very high scale values. Such a profile results when the individual answers "yes" to all the absolute judgment items. The problem with such a profile is that it, too, yields very high  $D^2$  values.

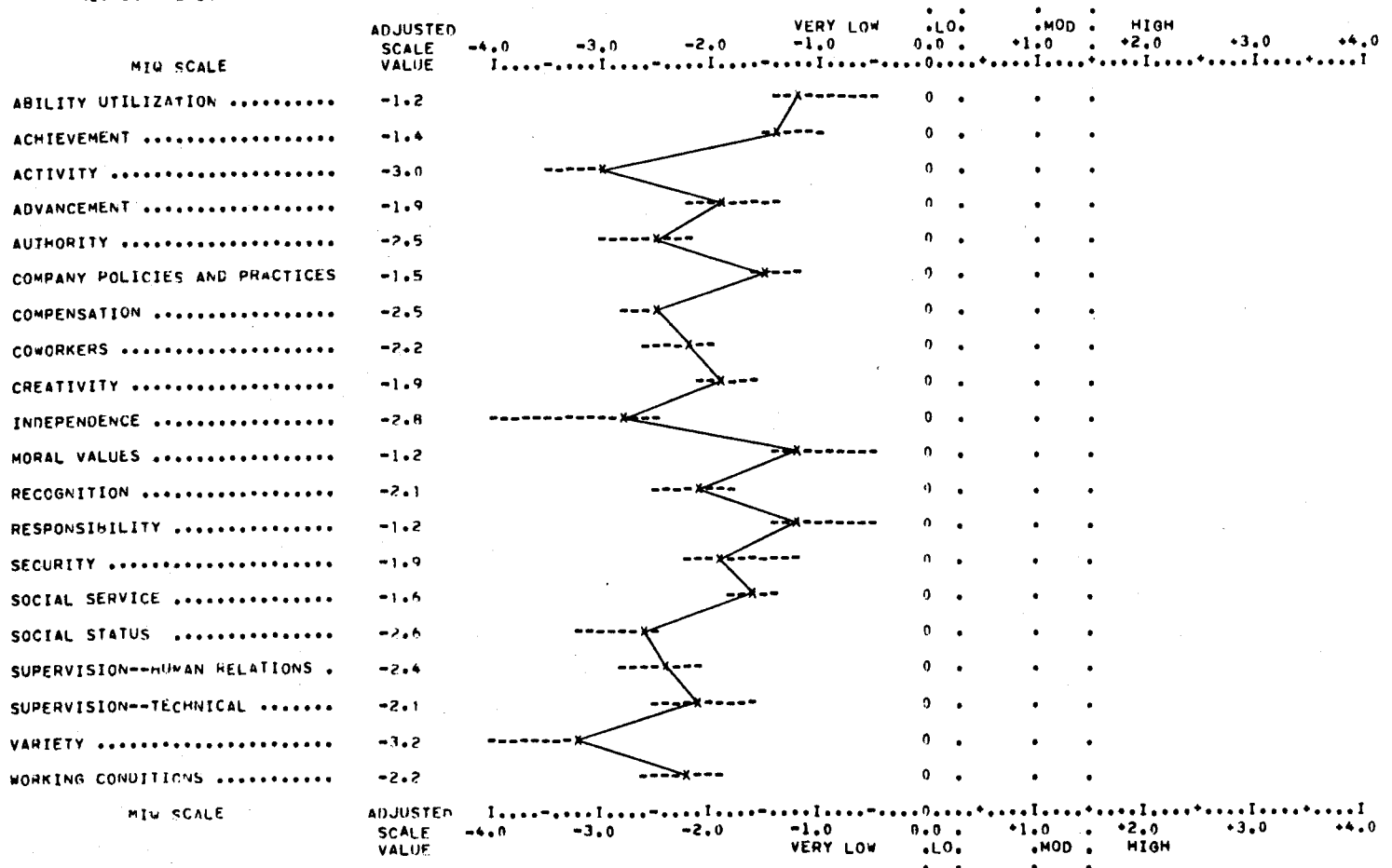
# Figure 4

## Sample Computer Report for an Extremely Low MIQ Profile

### REPORT ON THE MINNESOTA IMPORTANCE QUESTIONNAIRE (MIQ) 1967 REVISION

NAME--SAMPLE LOW PROFILE

CIRCULAR TRIAD SCORE= 142  
INVALID RESPONSE RANGE  
BEGINS AT 255.  
MIQ IS VALID.

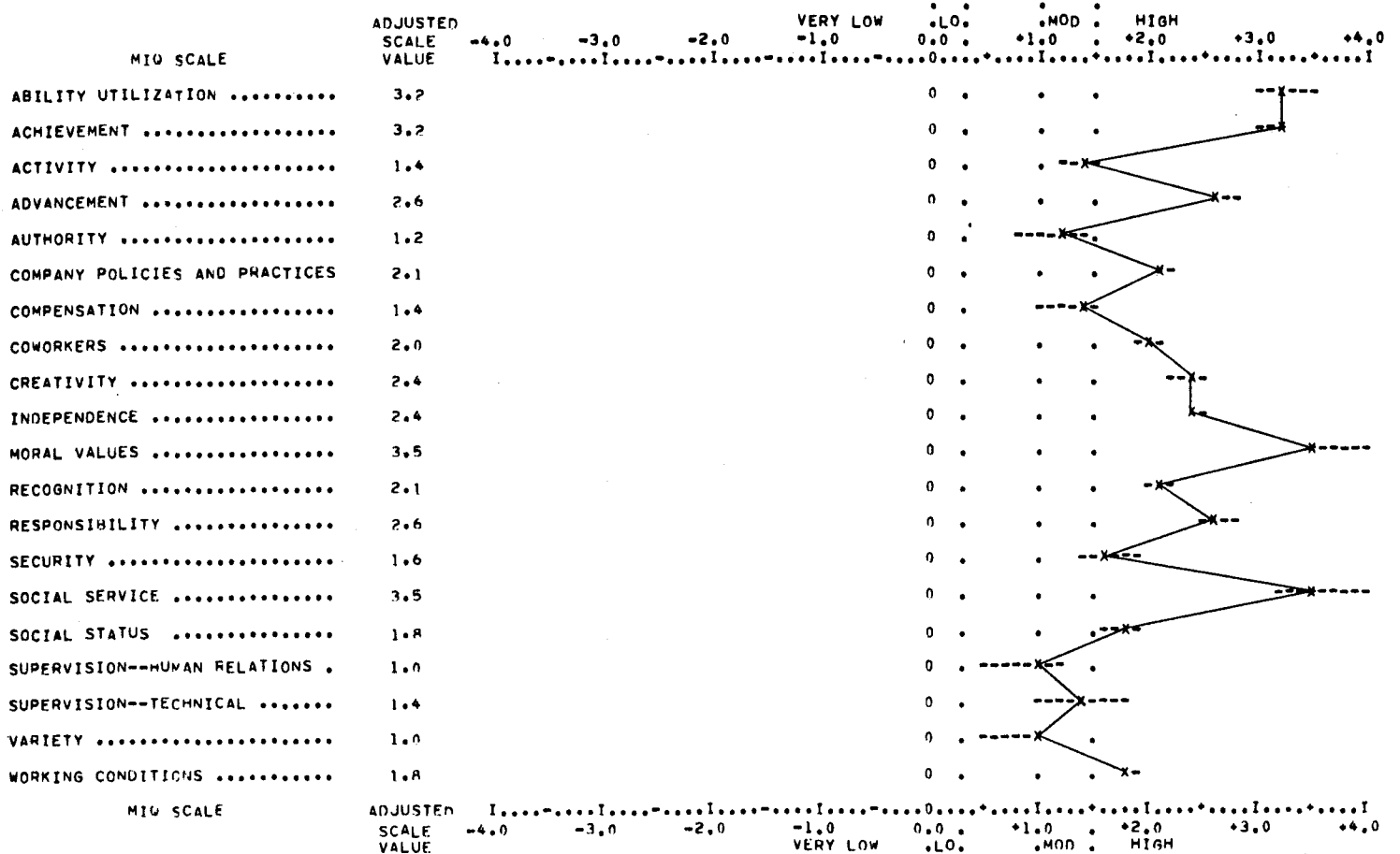


**Figure 5**  
**Sample Computer Report for an Extremely High MIQ Profile**

REPORT ON THE MINNESOTA IMPORTANCE QUESTIONNAIRE  
(MIQ)  
1967 REVISION

NAME--SAMPLE HIGH PROFILE

CIRCULAR TRIAD SCORE= 42  
INVALID RESPONSE RANGE  
BEGINS AT 255.  
MIQ IS VALID.



(In this case the lowest  $D^2$  was 34.80.) Such a profile, as with the extremely low one, is of little use to the vocational rehabilitation counselor. At the most, the counselor can use the salient scale values (both highest and lowest) and compare these with ORPs on the supposition that the "level effect" (elevation or depression) was spurious. Such a supposition, needless to say, is fraught with error unless other, more reliable, information can be brought to bear on the problem (e.g., information from school records or work history).

### Vocational Counseling Use of the MIQ.

The major use of the MIQ in vocational counseling is to measure the vocational needs of the counselee. As a measure of vocational needs, the MIQ's main usefulness is in vocational planning. With the MIQ, the vocational rehabilitation counselor can help the counselee look at jobs in terms of the correspondence of the jobs' reinforcer systems to his (the counselee's) vocational needs. To accomplish this goal, the computer report for the MIQ is designed to facilitate the search for need-reinforcer correspondence, that is, groups of jobs in which the counselee would be likely to be satisfied. Collating these job groups (in which the client would be *satisfied*) with those for which the counselee has ability correspondence (that is, job groups for which he is predicted to be *satisfactory*), groups of jobs can be identified for which the counselee would be predicted to be optimally work adjusted (*satisfactory and satisfied*).

The MIQ can be used in a number of other ways. For example, it can be used to prepare for the counseling relationship. The high scale values on the MIQ indicate which reinforcers might be effective in the counseling situation. High scores on Responsibility, Creativity and Authority might indicate a counselee who prefers to do things on his own and make his own decisions. High scores on Activity, Independence and Variety might indicate a counselee who is relatively impatient, who might want immediate action. The vocational rehabilitation counselor could utilize the MIQ-inferred reinforcers to influence the counseling process.

The MIQ could be used to assess the impact of disability. This is feasible if a pre-disability work history is available and the evidence indicates work adjustment for the counselee prior to the onset of disability. Pre-disability needs might be inferred from ORPs of satisfying jobs previously held by the counselee. Comparison of pre- and post-disability needs might provide insights into the impact of disability. Thus, a counselee might appear to be less achievement-



oriented or more security-conscious after becoming disabled. Such insights are useful not only in vocational planning but also in the management of the rehabilitation process for the counselee.

The MIQ might also be used to help a counselee, especially one severely disabled, plan the effective and satisfying use of his non-work time. When the nature of a counselee's disability limits the choice of possible jobs, available jobs are usually not satisfying to the individual. In such a case, careful choice of non-work activities can compensate for the lack of need-satisfaction in work.

## Section II. Technical Information

### Development of the MIQ

The MIQ was developed specifically as an instrument required by the *Theory of Work Adjustment*. At the time of the initial development of the theory, an appropriate measure of vocational needs required by the theory was not available. The first attempt by the Work Adjustment Project to measure vocational needs resulted in the N-Factors Questionnaire. This was a 48-item, twelve-scale instrument based on the work of Schaffer (1953). A description of this instrument and its development is available in *Minnesota Studies in Vocational Rehabilitation: XVI. The Measurement of Vocational Needs* (Weiss, Dawis, England and Lofquist, 1964a).

By modifying the N-Factors Questionnaire, a new instrument known as the Minnesota Importance Questionnaire was developed as a measure of vocational needs. The goals in developing the MIQ were: (1) to increase the number of dimensions measured by the questionnaire; (2) to increase the variability of the scores; and (3) to increase the reliability of the scales. This instrument consisted of twenty scales of five items each, in which the respondent was asked to rate how important a specific aspect of work was to him in his characterization of an "ideal" job. This Likert form of the MIQ is described in complete detail in the monograph just cited (The measurement of vocational needs). While this first MIQ was a marked improvement over the N-Factors Questionnaire, it still had some undesirable characteristics. In particular, it yielded negatively skewed distributions of scale scores and its scales intercorrelated to a rather high degree.

At this point it was decided to try a different item format for the MIQ, specifically a pair-comparison format.

*The MIQ (1965 Revision)*. To construct a pair-comparison form of the MIQ, it was first necessary to select one statement to represent each of the twenty scales of the Likert form of the MIQ. This was accomplished by selecting the scale item which had the highest correlation with total scale score. The items which were selected by this procedure were:

1. *Ability Utilization*: I could do something that makes use of my abilities.
2. *Achievement*: The job could give me a feeling of accomplishment.

3. *Activity*: I could be busy all the time.
4. *Advancement*: The job would provide an opportunity for advancement.
5. *Authority*: I could tell people what to do.
6. *Company Policies and Practices*: The company would administer its policies fairly.
7. *Compensation*: My pay would compare well with that of other workers.
8. *Co-workers*: My co-workers would be easy to make friends with.
9. *Creativity*: I could try out some of my own ideas.
10. *Independence*: I could work alone on the job.
11. *Moral Values*: I could do the work without feeling that it is morally wrong.
12. *Recognition*: I could get recognition for the work I do.
13. *Responsibility*: I could make decisions on my own.
14. *Security*: The job would provide for steady employment.
15. *Social Service*: I could do things for other people.
16. *Social Status*: I could be "somebody" in the community.
17. *Supervision — Human Relations*: My boss would back up his men (with top management).
18. *Supervision — Technical*: My boss would train his men well.
19. *Variety*: I could do something different every day.
20. *Working Conditions*: The job would have good working conditions.

Each of the above twenty statements was paired with every other statement to constitute 190 pair-comparison items. Then these 190 items were repeated, but with the order (sequence) of statements reversed. Thus, the 1965 MIQ consisted of 380 pair-comparison items. The respondent was asked to choose, for each item, the statement of the pair which was the more important to him in his description of an ideal job.

Scale internal consistency reliability coefficients for the 1965 MIQ ranged from .94 on Moral Values to .73 on Achievement, with a median of .82 (comparable to the scale reliabilities obtained for the earlier Likert form). A significant improvement in the scale intercorrelations was found with the new form. Median scale intercorrelation was -.02 with a range, in absolute value, from .00 to .64 (Weiss, Dawis, Lofquist and England, 1966; Fisher, Weiss and Dawis, 1968).

The factorial composition of the 1965 MIQ was found to be quite different than that of the earlier form. Three orthogonal factors emerged: (1) two of these factors were bipolar and seemed to represent the continuum of intrinsic-extrinsic vocational needs, but were composed of different sets of scales; and (2) the third factor was unipolar and seemed to represent company management as a source of reinforcement. These three factors accounted for approximately 30% of the total variance of the scales. Since the median reliability coefficient indicated that about 82% of the scale variance was reliable, over 50% of the variance of MIQ scale scores was reliable specific variance. This indicated that much information would be lost if only factor scores were reported; therefore, all twenty scale scores were used in further research. The elimination of the general factor, which was prominent on the Likert form of the MIQ, was evidence that the rating bias responsible for that factor had been eliminated by the pair-comparison format.

In summary, the 1965 MIQ was an improvement over the Likert MIQ since it resulted in lower scale intercorrelations and increased variability of the scale scores with no loss in the internal consistency of the scales.

*MIQ (1967 Revision).* The 1967 revision was designed to improve the MIQ in two respects — scaling properties and administration time. In terms of scaling, the 1965 MIQ yielded ordinal scores. While the rank order of scores had meaning, the numerical differences between scores could not be interpreted in terms of distances. The ordinal property of the MIQ scores severely limited comparison across individuals or across occasions. To remedy this deficiency, a “zero point” was introduced to represent — for an individual at one particular MIQ administration — the point on the scale at which a reinforcer was neither “important” nor “not important” to the individual. The “zero point” was derived from an “absolute judgment” section added to the pair-comparison section. In the “absolute judgment” section, the individual was asked to judge each

MIQ statement representing a scale as to whether it was important or not (using Yes and No as the response alternatives). The procedures for deriving the "zero point" are described below. With the "zero point" it became possible to treat scale scores as distances from a well-defined point on the scale, i.e., the scale scores acquired interval scale properties.

Administration time for the 1965 MIQ was a problem — it took most individuals almost an hour to complete the instrument. Many individuals took umbrage at the repetitiveness of the instrument. Since the purpose of repeating the items in reverse statement order was to arrive at some index of consistency of choice, it was decided to eliminate the second 190 items and to utilize a different approach to determining choice consistency. The different approach involved the use of the circular triad, an index of intransitivity of choice. Choices among three statements are transitive if A is picked over B, B over C, and A over C; they are intransitive (and hence a circular triad) if A is picked over B, B over C and C over A.

With these changes, the 1967 MIQ became a 210-item instrument with two sections — a pair-comparison section of 190 items and an absolute judgment section of twenty items.

### Scoring the 1967 Revision of the MIQ

*Raw Scores.* There are 21 raw scores generated by the scoring of the MIQ. Scores for vocational need scales constitute twenty of these 21 scores; the twenty-first is the "zero-point" scale by means of which the twenty vocational need scales are "anchored."

The raw score for each vocational need scale is the number of times the statement representing that scale is chosen as "more important" to the individual in his "ideal" job. For the pair-comparison section (items 1-190) the chosen statement is scored "1" and the statement not chosen is scored "0." For the absolute judgment section (items 191-210) the vocational need scales (statements) identified as "important" by a "yes" response are scored "1" and those identified as "not important" by a "no" response are scored "0." The zero-point scale raw score is obtained by counting the number of "no" responses to the twenty absolute judgment items (191-210). Raw scores, therefore, range from 0 to 20 for both the vocational need scales and the zero-point scale. Table 1 indicates which item represents which particular pair of vocational need statements. A scoring key can be developed from this table.

Table 1

Item identification of statement pairs in the 1967 MIQ  
(Table entries represent item numbers)

First state- ment	Second statement																			
	AU	Ach	Act	Adv	Au	CPP	Com	Cow	Cre	Ind	MV	Rec	Res	Sec	SSe	SSt	SHR	ST	Var	WC
AU																				
Ach	3																			
Act	23	13																		
Adv	14	10	1																	
Au	38	24	53	65																
CPP	55	39	4	25	15															
Com	125	57	40	54	83	107														
Cow	26	112	56	6	70	87	16													
Cre	146	27	128	58	41	71	88	2												
Ind	163	141	28	129	7	43	72	91	17											
MV	181	162	142	29	130	59	44	73	92	108										
Rec	190	180	161	143	30	8	60	42	82	98	18									
Res	171	189	179	160	144	31	120	61	45	75	100	103								
Sec	153	170	188	178	159	145	32	9	62	46	76	93	19							
SSe	135	152	169	187	177	158	138	33	114	63	47	77	96	111						
SSt	115	134	151	168	186	176	157	139	5	121	64	48	78	97	20					
SHR	110	116	133	150	167	185	175	156	140	34	119	69	49	79	99	127				
ST	94	105	86	132	149	166	184	174	155	11	35	122	66	50	80	101	21			
Var	89	85	104	117	126	148	165	183	173	154	136	36	123	67	51	81	102	113		
WC	84	90	95	106	118	131	147	164	182	172	12	137	37	124	68	52	74	109	22	
Zero point	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210

*Scale Values.* Since the MIQ utilized complete pair-comparison scaling with a psychological neutral-point (Gulliksen, 1964), scale values are determined for each scale by following the usual scaling procedures for pair comparisons (e.g., Edwards, 1957, Ch. 2).

An MIQ scale value is calculated by taking the raw score on a scale for an individual (the number of times a given statement is chosen over all other statements) and converting it to an intra-individual z-score. First, each raw score is expressed as a proportion of the total number of stimuli being scaled (21, including the zero point), and this proportion is converted to the appropriate z-value from the cumulative normal distribution. In calculating that proportion, .50 is added to the raw score to include the expected number of times the statement would be chosen over itself had such a comparison been made. A more complete rationale for this procedure is given by Guilford (1954). The MIQ scale values range from -2.0 to +2.0. Table 2 lists the raw score to scale value conversions made in scoring the MIQ.

**Table 2**  
**Conversion of raw MIQ scores to corrected proportions and scale values**

Raw Score	Corrected Proportion	Scale Value <sup>a</sup>
0	.024	-2.0
1	.071	-1.5
2	.119	-1.2
3	.167	-1.0
4	.214	-.8
5	.262	-.6
6	.309	-.5
7	.357	-.4
8	.405	-.2
9	.452	-.1
10	.500	.00
11	.548	.1
12	.595	.2
13	.643	.4
14	.691	.5
15	.738	.6
16	.786	.8
17	.833	1.0
18	.881	1.2
19	.929	1.5
20	.976	2.0

<sup>a</sup>Z-value from cumulative normal distribution

Scale values indicate how far in standard deviation terms a given raw score deviates from the individual's own mean raw score, which is arbitrarily defined as 0.0. For the scale values, the individual is his own basis for comparison, rather than some normative group.

The above procedure, because of its mathematics, always yields a set of scale values which are equally distributed around zero, with half the scale values positive and half negative. The scale values (z-scores) are half positive and half negative for all individuals, although different individuals will have different scale values for the different scales. Such scale values reflect only the relative levels of the measured vocational needs for a particular person and allow only very limited comparisons among different individuals. To obtain more meaningful comparison among individuals, scale values are adjusted by the following procedure.

*Adjusted Scale Values.* As previously noted, an individual's zero-point raw scale score is derived from his responses to items 191-210. The scale value of the zero-point scale is determined in the same way as the scale values for the twenty vocational need scales. Once the scale value for the zero-point is determined, scale values for the other twenty scales can be adjusted with respect to it by subtracting the zero-point scale value from the other scale values, and from itself. This procedure yields a group of 21 *adjusted scale values*, with the individual's zero-point scale value adjusted to zero and the vocational need scales adjusted with respect to the individual's zero-point. The potential range for adjusted scale values is from -4.0 to +4.0, but the maximum range of values for an individual is only half of that. Where this half falls depends on the zero-point scale value before adjustment.

Because of the adjustment procedure the sign of each adjusted scale value indicates whether the reinforcer is considered important or not. Adjusted scale values with positive signs indicate characteristics of the individual's ideal job, and therefore represent "significant" vocational needs. The magnitude of the adjusted scale value indicates *how* important a particular reinforcer is. Scale values with negative signs indicate characteristics which are *not* important to the individual and therefore are not relevant vocational needs for the individual.

All scale values reported for the 1967 Revision of the MIQ are *adjusted scale values*.

*Total Circular Triad Score.* The total circular triads score (TCT) indicates the logical consistency (transitivity of preference) with



which an individual has responded to the MIQ items and is simply the total number of circular triads. A circular triad occurs when an individual responds to a group of three items in the following manner:

Item 1. He chooses statement A over statement B.

Item 2. He chooses statement B over statement C.

Item 3. He chooses statement C over statement A.

This sequence of choices is described as illogical or intransitive.

If an individual were perfectly logically consistent in his responses to the MIQ, he would choose one statement over all the others, a second over all others except the first, a third over all but the first and second, and so forth down to the statement representing the twentieth vocational need, which he would choose over none of the other statements. At the other extreme would be an individual who is totally logically inconsistent in his responding. He would choose each statement half the time and its alternative half the time, so that all triads of statements would be intransitive. This individual would obtain the maximum number of circular triads, which for the MIQ is 385.

The total number of circular triads for an individual on the MIQ is calculated by the following formula (Kendall, 1955, p. 125):

$$TCT = (2870 - \sum_{i=1}^{21} X_i^2) / 2$$

where  $\sum_{i=1}^{21} X_i^2$  is the sum of

the squared raw scores for the vocational need scales (including the zero-point scale).

The distribution of TCT scores for random responding has a mean of 333 and a standard deviation of 15.8. For computer reporting, a TCT score of 254 was chosen as the maximum allowable for a valid profile. This number is 5.0 standard deviations below the mean TCT score for random responding. A TCT score of 255 or greater will not yield an MIQ computer report.

In a study of 4,682 administrations of the MIQ, the TCT scores ranged from 1 to 360, with a median of 73 and with 96% of the profiles being classified as valid on the basis of TCT score. Table 3 shows the distribution of TCT scores for this group of respondents.

**Table 3**  
**Distribution of total circular triad scores**  
**(N = 4,682)**

TCT Score	Frequency	Percent	Cumulative percent
0-14	70	1	1
15-24	220	5	6
25-34	359	8	14
35-44	462	10	24
45-54	442	9	33
55-64	428	9	42
65-74	394	8	50
75-84	348	7	57
85-94	290	6	63
95-104	252	6	69
105-114	179	4	73
115-124	190	4	77
125-134	143	3	80
135-144	112	2	82
145-154	95	2	84
155-164	102	2	86
165-174	71	2	88
175-184	66	1	89
185-194	57	1	90
195-204	42	1	91
205-214	40	1	92
215-224	39	1	93
225-234	30	1	94
235-244	29	1	95
245-254	30	1	96
255-385 (invalid)	192	4	100

*Error Bands.* Circular triads represent some indecision on the individual's part. To indicate the location of such indecision, error bands are computed for each scale from an analysis of the TCT score. Error bands indicate the limits to which the adjusted scale value could change if the individual were to respond in a perfectly logically consistent manner.

The computation of the error bands proceeds as follows: For each item, it is determined whether the individual's item choice appeared in a circular triad. On the assumption that an individual's scale scores are more reliable than each of the 210 item choices, each item choice which is involved in a circular triad is compared with the ranking of the individual's scale scores for the two statements in the item. Logically, the statement chosen should have the higher ranked scale score. A count is kept of each instance where the item choice is inconsistent with the scale ranking, separating the instances when the choice increases the scale score from those which decrease the scale

score. These counts are then added or subtracted (as the case may be) from the raw scores and converted to scale values. The result is a range of scale values around the observed scale value which represents the individual's indecision for the scale. It is this range which is represented on the computer report by the dashes (---) of the error band around the X which marks the observed adjusted scale value for each vocational need scale. (For additional information about this procedure see DeWitt and Weiss, 1969.)

*Random Response Patterns.* Invalid MIQ profiles (TCT greater than 254) can be divided into two types — true random and pseudo-random. To distinguish between these two types, the Stimulus Circular Triad (SCT) score associated with each scale is analyzed. The SCT score for a particular scale is derived by counting the number of times that the statement for that scale appears in a circular triad. The total number of SCT scores for all MIQ scales equals three times the number of Total Circular Triads (each circular triad involves three scale statements).

The assumption is that a rectangular distribution of SCT scores would be obtained if an individual were responding to the MIQ in a truly random manner. But if he were just having difficulty discriminating between certain of the statements, there would be more SCTs for those statements than for the others. Evaluation of the distribution of the SCTs is made by the use of the chi-square statistic.

A distribution of chi-square values for true random responding was developed from 1,000 randomly generated MIQ response records. For each random response record, the observed distribution of SCTs was compared with the expected distribution of SCTs among the 21 stimuli. A chi-square value was computed separately for each random response record. The cumulative frequency distribution of chi-square values for these 1,000 random response records is used to test the deviation of an observed chi-square value from the random response expectation. According to this distribution, there is only a 5% probability that a chi-square value greater than 25.9 would occur under conditions of true random responding. Therefore, if this value is reached, the response pattern is labeled pseudo-random and the appropriate message is printed on the MIQ computer report. (For further details of this procedure see DeWitt and Weiss, 1969).

*Comparison of MIQ Profiles with ORPs.* Since Occupational Reinforcer Patterns (ORPs, see Borgen et al., 1968b) are scaled by the same methods used in scaling the MIQ, thereby yielding

comparable scale values, and since ORPs and the MIQ refer to the same set of reinforcers, it is possible to compare MIQ profiles with ORPs. Several indices of "correspondence" can be used for such comparisons. Betz (1969) investigated the predictive efficiency of several correspondence indicators, with inconclusive results. For this reason, the simplest index available,  $D^2$ , is used in this manual as the index of MIQ-ORP (i.e., need-reinforcer) correspondence.

$D^2$  is the sum of the squared differences between an individual's MIQ adjusted scale values and the corresponding adjusted scale values for the ORP of a specific occupation. An example of the computation of  $D^2$  is shown in Table 4, in which the  $D^2$  is computed between an MIQ profile and the ORP for Sheet Metal Worker. The  $D^2$  for this MIQ-ORP comparison is 6.79. This is a low  $D^2$ , indicating high correspondence between the MIQ and the ORP, or, translated into more concrete terms, between the individual's vocational needs and the reinforcers available in the occupation of Sheet Metal Worker.

Table 4  
Example of computation of D-squared

Scale	MIQ Scale Value for Individual	ORP Scale Value for Occupation (Sheet Metal Worker)	D (Differ- ence)	$D^2$ (Difference squared)
Ability Utilization	1.4	1.37	.03	.0009
Achievement	2.6	1.35	1.25	1.5625
Activity	.6	.77	.17	.0289
Advancement	1.8	.85	.95	.9025
Authority	-.6	-.08	.52	.2704
Company Policies	.7	.84	.14	.0196
Compensation	1.6	.81	.79	.6241
Co-workers	.2	.63	.43	.1849
Creativity	-.2	.71	.91	.8281
Independence	.2	.41	.21	.0441
Moral Values	-.6	.53	1.13	1.2769
Recognition	.2	.90	.70	.4900
Responsibility	.4	.73	.33	.1089
Security	1.4	1.19	.21	.0441
Social Service	.8	.55	.25	.0625
Social Status	-.2	-.13	.07	.0049
Supervision-Human Relations	.6	.63	.03	.0009
Supervision-Technical	1.0	.76	.24	.0576
Variety	.2	.71	.51	.2601
Working Conditions	1.1	.96	.14	.0196
Total $D^2 = 6.7915$				
				= 6.79
				(rounded to two-decimal places)

As the correspondence between the individual's MIQ and the ORP for different occupations decreases,  $D^2$  increases. High  $D^2$ s indicate high dissimilarity (discorrespondence) and low  $D^2$ s indicate high similarity (correspondence). If the MIQ and ORP profiles are identical, the  $D^2$  would be zero. As an index of MIQ-ORP correspondence,  $D^2$  is non-directional. That is, the same  $D^2$  is obtained regardless of whether the MIQ scale values are above or below those of a given ORP, provided the scale value difference for each scale is the same. Current computation of  $D^2$  ignores the direction of differences; it simply reflects the total difference between the MIQ profile and the ORP. As further research is conducted, more sophisticated measures of MIQ-ORP correspondence will be provided.

From the distribution of  $D^2$ s obtained by persons in five occupations (in which MIQs were compared with the ORP of the job in which they were currently employed) several prediction statements have been developed to accompany the  $D^2$  values appearing in the computer reports. These are predictions of "satisfied" for  $D^2$ s less than 9.00, "likely satisfied" for  $D^2$ s between 9.00 and 20.00, and "not likely satisfied" for  $D^2$ s greater than 20.00. The distributions of  $D^2$  for these five groups are contained in Appendix C. These  $D^2$  cutting scores would predict about 25% of the persons in an occupation to be "satisfied," about 50% to be "likely satisfied" and about 25% to be "not likely satisfied."

The five occupations studied were vocational rehabilitation counselor, school counselor, cashier, marker and salesclerk. The "predictions" of satisfaction levels were based only on the fact that these persons had not left the occupation, and not on a direct measure of their satisfaction. The *Theory of Work Adjustment*, however, does state that satisfaction is related to need-reinforcer correspondence on the one hand and tenure on the other. In support of the *Theory of Work Adjustment*, Betz (1969) has shown that MIQ-ORP correspondence predicts satisfaction and Taylor and Weiss (1969) have shown that satisfaction does predict job termination.

## Reliability

The reliability of the MIQ can be evaluated in three ways: (1) the internal consistency of the scales; (2) the stability of MIQ scale scores over time; and (3) the stability of MIQ profiles over time. These three types of reliability can be studied separately, but their interrelationships are also meaningful. Reliability data on the 1967

MIQ supports the conclusion that it is reliable enough to be useful to the vocational rehabilitation counselor.

*Scale Internal Consistency.* Scale internal consistency was investigated by calculating the Hoyt reliability coefficient for each MIQ scale for each of the nine different subject groups (Hendel and Weiss, 1970a). The results of this study are summarized in Table 5. Groups 1, 2, 3 and 4 were composed of college students, predominantly sophomores; groups 5 and 6 were high school students; group 7 consisted of night school students; group 8 was composed of individuals in a New Careers program; and group 9 consisted of junior and senior college students. All groups included both males and females.

**Table 5**  
Range and median of Hoyt reliability  
coefficients for 20 MIQ scales, by group<sup>a</sup>

Group	N	Hoyt reliability coefficients		
		Range		Median
		Low	High	
1	42	.42	.92	.81
2	146	.58	.94	.81
3	157	.55	.95	.80
4	283	.63	.95	.81
5	73	.62	.93	.79
6	180	.59	.92	.80
7	27	.48	.95	.81
8	53	.40	.89	.77
9	38	.30	.90	.78

<sup>a</sup>From Hendel and Weiss (1970a)

The median scale Hoyt reliability coefficients for the nine groups ranged from .77 to .81. The lowest reported single scale reliability for any group was .30, and the highest (found in three groups) was .95. These data indicate that the individual scales have sufficient internal consistency reliability to meet usually accepted standards. However, other types of reliability are more meaningful for use with the pair comparison MIQ.

*Stability of MIQ Scale Scores.* Hendel and Weiss (1970a) also investigated the stability of MIQ scale scores for different test-retest intervals ranging from an immediate retesting for one group to a ten-month retest for another group. The range and median scale stability coefficients are presented in Table 6.

The same nine groups described above were involved as subjects but with the addition of a tenth group (group 5b) consisting of vocational-technical high school women. The median scale stability coefficients ranged from .48 for the six-month interval (the group consisted of high school students) to .89 for immediate retesting (a group of college sophomores). The lowest reported scale stability coefficient was .19 (for a nine-month interval) and the highest was .93 (in immediate retest). The range of scale stability coefficients for the longest interval studied (ten months) was from .46 to .79 with a median of .53.

**Table 6**  
Range and median of scale  
stability coefficients, by group<sup>a</sup>

Group	N	Test-retest Interval	Stability coefficients		
			Range		Median
			Low	High	
1	42	immediate	.72	.93	.89
2	146	1 week	.62	.91	.81
3	157	2 weeks	.66	.89	.79
4	283	6 weeks	.65	.83	.75
5a	73	4 months	.35	.77	.63
5b	182	4 months	.45	.67	.58
6	180	6 months	.40	.68	.48
7	27	7 months	.40	.83	.68
8	53	9 months	.19	.77	.49
9	38	10 months	.46	.79	.53

<sup>a</sup> All data except group 5b from Hendel and Weiss (1970a). Data for group 5b consisted of adjusted scale values; all other data were raw scale scores.

*Stability of MIQ Profiles.* From a counseling viewpoint, the stability of score profiles is at least as important as that of scale scores. Hendel and Weiss (1970a) reported MIQ profile stability coefficients for time intervals ranging from immediate retesting to 10 months. The MIQ profile stability coefficients for ten subject groups are contained in Table 7.

The median stability coefficients ranged from .95, for the immediate retest, to .70 for the four-month retest interval group. The lowest profile stability coefficient reported for one individual was .44 (a high school student in the six-month retest group) and the highest, .98 (two college sophomores in the one-week and two-week retest interval groups). For the ten-month retest interval (the longest interval studied), profile stability correlations ranged from

.58 to .97 with a median of .87. These results indicate that for most people MIQ profiles are relatively stable over periods approaching one year. (Studies of MIQ profile stability over longer periods are still in progress.) The data also show that MIQ profiles are more stable than MIQ scale scores, suggesting that profile analysis is a more useful basis for interpretation than the analysis of scale scores.

**Table 7**  
**Range and median of MIQ**  
**profile test-retest stability coefficients<sup>a</sup>**

Group	N	Test-retest Interval	Range		Median
			Low	High	
1	42	immediate	.71	.97	.95
2	146	1 week	.43	.98	.90
3	157	2 weeks	.11	.98	.89
4	283	6 weeks	.19	.97	.87
5a	73	4 months	-.04	.97	.78
5b	182	4 months	.42	.93	.70
6	180	6 months	-.44	.95	.71
7	27	7 months	.48	.93	.83
8	53	9 months	.29	.94	.76
9	38	10 months	.58	.97	.87

<sup>a</sup> All data except group 5b from Hendel and Weiss (1970a). Data for group 5b consisted of adjusted scale values; all other data were raw scale scores.

*The Relationship Between TCT Score and MIQ Stability.* One interesting and potentially useful finding from the reliability studies on the MIQ was the observed relationship between the respondent's TCT score and the stability of his vocational needs (as measured by the test-retest or stability coefficient). Hendel and Weiss (1970a) reported correlations ranging from -.24 to -.68 between TCT score and stability coefficient. The correlations between TCT score and MIQ profile stability for the same ten groups are listed in Table 8. In eight of the ten groups the correlation was significantly different from zero at the .01 level. In addition, Hendel and Weiss found significant differences in stability coefficients between low and high TCT groups.

These results suggest the importance of specific individual factors in the stability of questionnaire responses, and the usefulness of the TCT score in the detection of such factors. The more logically consistent the responses of an individual, the greater the predicted stability of his response pattern.



Table 8

Product-moment correlations between time 1  
TCT and individual stability coefficients<sup>a</sup>

Group	N	Time Interval	Correlation	Level of significance
1	42	Immediate test-retest	- .57	$p < .01$
2	146	1 week	- .47	$p < .01$
3	157	2 weeks	- .56	$p < .01$
4	283	6 weeks	- .61	$p < .01$
5a	73	4 months	- .50	$p < .01$
5b	182	4 months	- .49	$p < .01$
6	180	6 months	- .45	$p < .01$
7	27	7 months	- .68	$p < .01$
8	53	9 months	- .25	Not significant
9	38	10 months	- .24	Not significant

<sup>a</sup>All data except for group 5b from Hendel and Weiss (1970a). Adjusted scale values were used for group 5b; for all other groups raw scale scores were used.

### Scale Intercorrelations

A study of scale intercorrelations for the 1967 MIQ, derived from data for 5,358 individuals, showed scale intercorrelations ranging from .05 to .77 with a median intercorrelation of .33. The intercorrelations are contained in Table 9.

Subgroups of the total group of 5,358 individuals in the analysis reported above included 3,033 employed workers, 1,621 vocational rehabilitation clients, 419 college students and 285 vocational-technical school students. The scale intercorrelations for these subgroups were also computed. They showed little deviation from the total group intercorrelation matrix presented in Table 9 and, hence, are not included in the present monograph.

### Factor Composition

MIQ scale intercorrelation data were submitted to orthogonal principal axes factor analyses using squared multiple correlations as communality estimates, followed by Varimax rotation. Factors rotated included all those accounting for 100% of estimated common variance. This was done for the heterogeneous group of 5,358 individuals, and separately for each of three subgroups consisting of 1,621 vocational rehabilitation clients, 3,033 employed workers and 419 college students. Table 10 shows the factor loadings for the total

Table 9

Intercorrelations of adjusted scale values of the 20 MIQ scales  
(Total group: N = 5,358)

	AU	Ach	Act	Adv	Au	CPP	Com	Cow	Cre	Ind	MV	Rec	Res	Sec	SSe	SSt	SHR	ST	Var	WC
AU																				
Ach	.63																			
Act	.37	.38																		
Adv	.49	.47	.26																	
Au	.33	.28	.27	.43																
CPP	.34	.37	.30	.37	.27															
Com	.23	.28	.30	.45	.33	.41														
Cow	.29	.37	.40	.23	.26	.34	.30													
Cre	.53	.45	.21	.40	.49	.28	.21	.22												
Ind	.27	.25	.49	.21	.28	.21	.27	.28	.26											
MV	.21	.26	.11	.10	.10	.39	.14	.27	.18	.05										
Rec	.43	.50	.36	.53	.43	.37	.46	.32	.38	.31	.12									
Res	.50	.47	.27	.45	.58	.27	.26	.25	.77	.36	.16	.42								
Sec	.27	.28	.50	.42	.21	.36	.48	.37	.09	.34	.13	.36	.15							
SSe	.40	.44	.35	.17	.22	.25	.06	.40	.33	.19	.28	.20	.32	.17						
SSt	.31	.32	.28	.40	.45	.23	.33	.37	.26	.29	.12	.48	.33	.31	.25					
SHR	.28	.32	.35	.40	.34	.61	.45	.32	.30	.24	.27	.40	.32	.39	.21	.24				
ST	.34	.33	.43	.40	.33	.56	.39	.36	.25	.29	.21	.38	.27	.42	.24	.28	.69			
Var	.33	.33	.50	.27	.38	.22	.27	.38	.40	.47	.10	.32	.43	.26	.33	.33	.25	.26		
WC	.32	.35	.46	.39	.25	.49	.51	.44	.18	.37	.12	.42	.23	.56	.22	.34	.45	.49	.33	

group. Factor loading matrices for the subgroups can be found in Appendix D.

As Table 10 shows, a seven-factor solution was appropriate for the total group data, with the seventh factor being a residual. The six factors and the scales loading highly on them were: I) Management (Supervision—Human Relations, Supervision—Technical, Company Policies and Practices, Compensation, Working Conditions, and Security); II) Autonomy (Responsibility, Creativity, and Authority); III) Conditions of Work (Activity, Independence, Variety, Security, and Working Conditions); IV) Altruism (Social Service, Moral Values, and Co-workers); V) Achievement (Ability Utilization, Achievement, and Advancement); and VI) Recognition (Social Status, Recognition, and Authority). These six factors plus the residual accounted for 54% of the total variance, leaving 46% specific to the individual scales.

In comparing the subgroup factor analyses shown in Appendix D, several factors are observed to appear consistently across groups. A triad of scales which load high on one factor for all the subgroups consists of Supervision-Human Relations, Supervision-Technical, and Company Policies and Practices. These scales are the three with the highest loadings on the Management factor for the group analysis and reflect the fact that supervision and management operate as reinforcers in the work environment. The three scales appear to refer to the need of a worker to have his supervisor and employer treat him not only fairly but with respect.

The Responsibility and Creativity scales define a factor found for all three subgroups studied as well as for the total group. These scales seem to revolve around a need for autonomy within the work environment. In the total group analysis, they are joined by the Authority scale in defining the factor.

A "working conditions" dyad, consisting of the Working Conditions and Security scales, appears to define a factor for all three subgroups. For these subgroups, the need for security seems to be related to the need for good working conditions. In the total group analysis this dyad is found in both the Management and the Conditions of Work factors.

Another triad of scales which defines a factor present in all three subgroups consists of Activity, Independence, and Variety. In the total group analysis, they define the Conditions of Work factor. This triad is found most clearly in the vocational rehabilitation client subgroup, underscoring the perception of conditions of work as a separate, distinctive set of reinforcers in the work setting.

**Table 10**  
**Varimax factor loading matrix for the total group**  
**(N = 5,358)**

	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI	Factor VII	$h^2$
Ability Utilization	-.16	.38	-.21	-.25	-.56	-.11	.00	.60
Achievement	-.18	.28	-.20	-.34	-.56	-.17	-.03	.61
Activity	-.27	.07	-.67	-.14	-.19	-.11	.04	.59
Advancement	-.37	.33	-.08	.03	-.41	-.37	-.12	.58
Authority	-.21	.54	-.17	-.04	-.02	-.40	.06	.53
Company Policies and Practices	-.64	.14	-.09	-.33	-.12	-.07	-.09	.58
Compensation	-.49	.13	-.20	.01	-.09	-.34	-.29	.50
Co-workers	-.22	.05	-.37	-.44	-.07	-.28	-.06	.46
Creativity	-.10	.77	-.12	-.19	-.22	-.05	-.02	.70
Independence	-.16	.22	-.58	-.01	-.05	-.12	-.04	.43
Moral Values	-.22	.08	.03	-.47	-.05	-.00	-.04	.28
Recognition	-.33	.28	-.19	-.05	-.32	-.45	-.05	.54
Responsibility	-.11	.79	-.20	-.13	-.19	-.14	-.03	.75
Security	-.44	-.09	-.42	-.03	-.20	-.26	-.23	.54
Social Service	-.03	.18	-.28	-.51	-.22	-.06	.11	.44
Social Status	-.14	.21	-.23	-.13	-.12	-.55	-.00	.45
Supervision - Human Relations	-.74	.21	-.12	-.18	-.05	-.10	.05	.66
Supervision - Technical	-.70	.13	-.24	-.17	-.12	-.11	.14	.63
Variety	-.08	.34	-.56	-.16	-.05	-.17	.01	.49
Working Conditions	-.49	-.00	-.41	-.12	-.16	-.25	-.24	.58
Contribution of factor Proportion of common variance	2.71 .25	2.26 .21	2.03 .19	1.16 .10	1.21 .11	1.28 .12	.27 .02	10.91 1.00
Proportion of total variance	.14	.11	.10	.06	.06	.06	.01	.54

The triad of Moral Values, Co-workers and Social Service scales is also found in all of the subgroup analyses. These scales define the Altruism factor in the total group analysis. They appear most clearly as defining a factor in the college student group, with additional scales being included in the other two subgroups. In the vocational rehabilitation client subgroup analysis, the Company Policies and Practices and two Supervision scales load on the same factor with these three scales. In the employed worker group analysis, the triad is joined by the Achievement and Ability Utilization scales.

These latter two scales (Achievement and Ability Utilization) constitute another dyad which appears across subgroups. The dyad defines the Achievement factor in the total group analysis. These two needs tend to be found together across groups and might best be described by the statement, "Achievement through Ability Utilization," indicating not only a need to use one's abilities but also a need to use them expertly, to achieve success by their use.

Another triad which is found across subgroups is the combination of Authority, Recognition and Social Status. This grouping of scales fits the commonly held belief that the three go together in the "real world." For the employed worker and vocational rehabilitation client subgroups the Compensation scale has a higher loading than the Social Status scale, but the reverse occurs for the college student subgroup with the Social Status scale having the higher loading. The Recognition scale has moderate loadings for all three subgroups. These three scales define the Recognition factor for the total group.

In summary, the MIQ factor structures for the three subgroups appear to have several common elements, i.e., several similar groupings of scales which define factors. These factors, then, are observed uniformly across subgroups, whether they be groups of vocational rehabilitation clients, employed workers or college students. The contrasting differences among subgroups provide these factors with some measure of generality. It appears, therefore, that the total group factor analysis results can be utilized generally in interpreting MIQ scale scores. That is, one way of interpreting MIQ data can be by reference to the underlying factors of *Management* (the triad of Supervision-Human Relations, Supervision-Technical, and Company Policies and Practices), *Autonomy* (the triad of Responsibility, Creativity, and Authority), *Conditions of Work* (the dyad of Security and Working Conditions, and the triad of Activity, Independence and Variety), *Altruism* (the triad of Moral Values, Co-workers and Social Service), *Achievement* (the dyad of Achieve-

ment and Ability Utilization), and *Recognition* (the triad of Authority, Recognition, and Social Status). The Advancement scale can be located in the factors of Management, Achievement, and Recognition. It should be noted, however, that factor interpretation of the MIQ accounts for only about half of the total variance of scale scores.

## Validity

Evidence of the validity of the 1967 MIQ is provided in a number of ways. These are grouped into three sections for ease of presentation. The first section consists of structural evidence of the MIQ's validity as, for example, its content and discriminant validities. The second section consists of indirect evidence of the MIQ's validity derived from research with earlier (i.e., pre-1967) forms. The last section encompasses validity evidence based on research with the present 1967 form.

In the discussions to follow, "validity" is taken simply as the demonstration that an instrument functions as it was intended to function, in this case, that the MIQ measures "vocational needs" as this concept is defined in the context of the *Theory of Work Adjustment*.

*Structural Evidence of Validity.* The manner in which an instrument is constructed and its resulting properties provide some evidence for its validity. In this respect, the reliability of the instrument is one essential and necessary (though not sufficient) condition for its validity. The reliability of the MIQ was discussed in a previous section and it was shown that the MIQ adequately meets this criterion.

The discriminant validity of the MIQ scales is another desired structural property. This property is reflected in the scale intercorrelations and the factor structure of the MIQ scales. The evidence, presented in preceding sections, shows that the MIQ scales measure a number of discriminably different dimensions. Thus, new (and potentially useful) information is contributed by each of the MIQ scales.

Discriminant validity for the MIQ is also shown in another way. Research previously reported in this series (Weiss, Dawis, Lofquist and England, 1966) has shown that the relationship of the MIQ to a multifactor measure of abilities, the General Aptitude Test Battery (GATB), is uniformly low regardless of the index used. Cross-correlations between MIQ scales and GATB tests clustered around zero,

with very few exceeding .30. Canonical correlations between the set of MIQ scale scores and the set of GATB test scores were generally in the low .50's.

On the other hand, evidence of convergent validity for the MIQ is provided by the findings of Thorndike, Weiss and Dawis, (1968a,b). Using the 1965 form of the MIQ, they report canonical correlations of .78 and .74 with the Strong Vocational Interest Blank (SVIB) for groups of college students and Division of Vocational Rehabilitation applicants, respectively. At the very least, these findings show that the MIQ is more similar in what it measures to the SVIB than to the GATB, an outcome theoretically to be desired.

*Evidence from Earlier Forms.* While strictly speaking the evidence to be cited in this section does not concern the 1967 MIQ but rather the Likert form and the 1965 version, the fact that the 1967 MIQ consists of items derived from these earlier forms should weigh in favor of examining such evidence for indirect support for the validity of the current MIQ. This evidence is of two types — group differences and confirmation of hypotheses from the *Theory of Work Adjustment*.

A time-honored method of validating an instrument is to demonstrate its ability to differentiate among groups in meaningful ways, on the assumption that an invalid instrument cannot do so. Scale score differences on the Likert form of the MIQ were found between disabled and non-disabled workers, between different occupational groups and between an employed group and a pre-employment group. The data may be summarized as follows (details are given in Weiss, Dawis, England and Lofquist, 1964a):

1. Disabled workers differed in both level (generally lower) and variability (generally greater) on several MIQ scales from a comparable group of non-disabled workers. Disabled workers tended to have higher scores on "status" needs (Authority, Independence and Social Status), but lower scores on work-oriented needs (Achievement, Advancement, Company Policies and Practices, Co-workers, Moral Values, Security, Social Service, Supervision-Human Relations and Supervision-Technical).
2. Occupational group differences were observed in level, variability and ranking on many MIQ scales. For example, managers had the highest means and the smallest variability in scores on Ability Utilization, Achievement, Advancement, Compensation, Creativity, Recognition, Responsibility and

Variety. Security was ranked highest by non-managerial groups, while the managerial group ranked Advancement highest. (A later study, this time using the 1965 MIQ, confirmed the finding of occupational group differences. See Weiss, Dawis, Lofquist and England, 1966).

3. Contrasted with a comparable group of managers and skilled white collar workers, a pre-employment group of college students had lower means and greater variabilities on all but three scales (Ability Utilization, Social Service and Social Status). In addition, differences were found between men and women on the same jobs and between different length of tenure groups in a study wherein the MIQ was used to infer occupational reinforcement (Weiss, Dawis, England and Lofquist, 1965).

All of these findings are consistent with expectations from the *Theory of Work Adjustment* concerning the development and stabilization of vocationally relevant needs.

Tests of hypotheses derived directly from the *Theory of Work Adjustment* constitute the other type of pre-1967 MIQ validity data. With satisfaction as the dependent variable, and need (MIQ) and reinforcement (estimated) as the independent variables, findings such as the following have been reported:

1. The variability of satisfaction scores was significantly greater for the high need than for the low need group;
2. Average satisfaction of the high-need — high-reinforcement group was significantly higher than that of the high-need — low-reinforcement group;
3. Average satisfaction of the high-need — low-reinforcement group was significantly lower than that of the low-need — low-reinforcement group; and
4. Average satisfaction of the low-need — high-reinforcement group was higher than that of the low-need — low-reinforcement group.

Such evidences of validity were found for ten of sixteen scales in one study (Weiss, Dawis, England and Lofquist, 1964b) and for thirteen of twenty scales in another study (Golden and Weiss, 1968).

These findings also confirm the *Theory of Work Adjustment* proposition that satisfaction is a function of the correspondence



between the reinforcer system of the work environment and the needs of the individual. In further support of this proposition (and thereby as validity evidence for the MIQ), Weiss, Dawis, England and Lofquist (1965) also reported that through the use of both linear multiple regression and reciprocal averages prediction, MIQ scale scores can predict job satisfaction in situations where job reinforcers are held constant, e.g., as for one occupational group.

*Validity evidence for the 1967 form.* Validity evidence for the 1967 MIQ follows much the same pattern as that for earlier forms, i.e., validation by way of group differences and tests of hypotheses from the *Theory of Work Adjustment*. At the present time only validity of the concurrent type is available. Due to the newness of the instrument, predictive studies have yet to be completed.

Data are available on nine different groups: (1) Vocational Rehabilitation Counselors (N=317); (2) Retail Trade Workers I (from one large work organization; N=1,897); (3) Retail Trade Workers II (from another large work organization; N=578); (4) Vocational Rehabilitation Clients (N=1,621); (5) High School Counselors (N=71); (6) High School Students (N=71); (7) College Students (N=71); (8) Low Socioeconomic Status College Students (N=125); and (9) Vocational-Technical High School Women (N=285). Adjusted scale value mean differences among these groups were evaluated by an unweighted one-way analysis of variance for each of the twenty MIQ scales separately. The results of these analyses are shown in Table 11.

Statistically significant differences were observed for all twenty MIQ scales, with the largest differences (indicated by  $\eta^2$ ) occurring for (in rank order): Supervision—Human Relations, Security, Activity, Compensation and Working Conditions. For these scales, the differences were produced by the relatively high scores of the retail workers contrasting with the low scores of the students, both high school and college. In other words, the contrast was between those who had experienced work and those who had not, a finding in accord with expectations from the *Theory of Work Adjustment*.

On the other hand, the smallest (though statistically significant) differences observed between groups occurred for Co-workers, Variety, Ability Utilization, Social Status, Responsibility and Achievement. Ability Utilization and Achievement were rated high by all groups, Social Status was rated low by all groups, and the remaining scales were rated in the middle by all groups.

Table 11

Means and standard deviations of MIQ adjusted scale values for nine groups  
and statistics for one-way ANOVA, by scale

	Group																		F-ratio <sup>a</sup>	p <sup>b</sup>	Eta <sup>2</sup>	p <sup>c</sup>
	Vocational Rehabilitation Counselors (N = 317)	Retail Trade Workers - I (N = 1897)	Retail Trade Workers - II (N = 578)	Vocational Rehabilitation Clients (N = 1621)	High school Counselors (N = 71)	High school Students (N = 71)	College Students (N = 71)	Low socio- economic status college students (N = 125)	Vocational- Technical High school Women (N = 285)													
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD				
AU	1.72	.60	1.53	.74	1.55	.68	1.63	.75	1.58	.58	1.24	.59	1.45	.60	1.76	.74	1.82	.71				
Ach	1.78	.59	1.55	.70	1.77	.63	1.56	.71	1.70	.55	1.44	.60	1.51	.61	1.87	.64	1.79	.61				
Act	.10	.82	.72	.73	.82	.71	.63	.86	.02	.67	.05	.86	.13	.81	.70	.75	.91	.74				
Adv	1.29	.68	1.60	.87	1.57	.85	1.41	.84	1.01	.68	1.20	.71	1.14	.75	1.69	.71	1.55	.70				
Au	.08	.83	.12	.87	.05	.85	.21	.94	.47	.72	.30	.76	.23	.90	.21	.78	.29	.76				
CPP	1.00	.66	1.23	.75	1.27	.69	.88	.69	.92	.61	.64	.58	.82	.70	1.14	.61	1.00	.60				
Com	.84	.79	1.38	.86	1.23	.83	.82	.82	.64	.72	.60	.85	.45	.85	.82	.85	.67	.80				
Cow	.62	.67	.70	.69	.79	.63	.69	.72	.73	.64	.81	.58	.69	.74	.74	.64	.89	.66				
Cre	1.31	.69	1.13	.75	1.13	.78	.86	.86	1.32	.59	.89	.73	1.18	.70	1.17	.72	.85	.79				
Ind	.15	.87	.24	.86	.19	.80	.36	.95	.47	.75	.01	.86	.24	.86	.41	.79	.40	.84				
MV	1.23	1.21	1.15	1.02	.85	1.02	.74	1.02	1.40	1.07	.94	1.15	1.18	1.20	.94	.85	.83	.79				
Rec	.93	.71	1.26	.77	1.26	.73	.97	.79	.69	.75	.78	.79	.68	.76	.97	.76	1.02	.78				
Res	1.28	.62	1.08	.73	1.14	.75	.92	.81	1.19	.58	.77	.69	1.02	.72	1.10	.73	.81	.78				
Sec	.60	.83	1.43	.89	1.26	.79	1.36	.84	.59	.71	1.09	.88	.45	.85	1.40	.80	1.44	.76				
SSE	1.50	.81	1.01	.78	1.08	.80	1.12	.91	1.67	.76	1.04	.95	1.08	1.00	1.73	.75	1.60	.94				
SSt	.18	.90	.09	.91	.25	.86	.09	1.02	.19	.86	.24	1.13	.16	.97	.12	.99	.16	.89				
SHR	.90	.64	1.31	.80	1.15	.74	.71	.76	.67	.59	.49	.68	.44	.68	.83	.56	.68	.69				
ST	.69	.62	1.07	.75	1.05	.72	.86	.72	.23	.65	.42	.63	.27	.65	.88	.51	.77	.59				
Var	.44	.81	.62	.77	.51	.75	.50	.92	.38	.69	.58	.81	.38	.87	.54	.84	.83	.78				
WC	.71	.70	1.24	.78	1.31	.68	1.04	.69	.74	.60	.80	.70	.50	.62	1.15	.63	1.23	.57				
TCT	61.99	47.98	99.86	71.66	81.53	47.01	92.82	67.60	57.10	46.33	83.31	59.99	55.26	40.06	91.61	54.56	94.28	58.35				

<sup>a</sup>One-way ANOVA F ratio with (8.5545) degrees of freedom.<sup>b</sup>Probability of rejecting the null hypothesis of no differences in group means.<sup>c</sup>Probability value from Bartlett's test of homogeneity of group variances.

Scales of high importance (adjusted scale values of 1.5 or higher) were the following:

1. For Vocational Rehabilitation Counselors — Achievement, Ability Utilization, and Social Service.
2. For Retail Trade Workers I — Advancement, Achievement, and Ability Utilization.
3. For Retail Trade Workers II — Achievement, Advancement, and Ability Utilization.
4. For Vocational Rehabilitation Clients — Ability Utilization and Achievement.
5. For High School Counselors — Achievement, Social Service, and Ability Utilization.
6. For High School Students — none.
7. For College Students — Achievement.
8. For Low Socioeconomic Status Students — Achievement, Ability Utilization, Social Service and Advancement.
9. For Vocational-Technical High School Women — Ability Utilization, Achievement, Social Service and Advancement.

Demographic data (sex, age, education, occupational tenure and marital status) were available for the four largest groups of subjects (Vocational Rehabilitation Counselors, Retail Trade Workers I and II and Vocational Rehabilitation Clients). MIQ adjusted scale value differences among groups classified according to demographic variables were tested by weighted means two-way analyses of variance. The results of these analyses are summarized in Table 12, and the main effect means for the four groups on all twenty MIQ scales are contained in Appendix E. Interactions are not reported because less than 5% were significant at the .05 level, and those found significant were not replicated in other groups. It was concluded that the significant interactions observed were chance results.

Taking as an arbitrary criterion the replication of results in at least one other group, the following conclusions may be drawn from Table 12:

1. Sex was a factor related to scores on fifteen of the MIQ scales and the TCT score. Females tended to score higher on Achievement, Activity, Company Policies and Practices,

Co-workers, Independence, Social Service and Working Conditions. Males tended to score higher on Advancement, Authority, Compensation, Creativity, Recognition, Responsibility, Security, Social Status, Supervision — Human Relations and Total Circular Triads score.

Table 12

Significant differences in mean MIQ adjusted scale values, by scale

MIQ Scale	Sex				Age				Education				Tenure		Marital Status	
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
AU					+		+		+	+			+			O
Ach		F		F	+		+		+				+			O
Act		F	F		+	+	+		-	-			+		M	O
Adv	M	M	M	M	C		C		+	+						M
Au	M	M	M	M	C		C						+			M
CPP			F	F	+	+	+		-	-					O	O
Com				M		+	+						C			M
Cow		F	F	F		C			-						S	S
Cre		M	M	M					+	+			+			O
Ind		F	F				C	+	+				C			O
MV			F		+		+						+			M
Rec	M			M			+									M
Res		M	M	M	C		C		+	+			+			M
Sec	M			M			+		-							M
SSe	M		F	F	+	C			C	-						
SSt		M	M	M		C			-				C	C		O
SHR		M		M	+	+	+	+	-					+	M, O	M
ST						+							C		O	
Var									-						S	
WC		F	F			+	+		-	-					M	
TCT	M	M			-		C		-	-						S

Cell entries indicate statistically significant findings, as follows:

Sex: F - females have higher mean

M - males have higher mean

Age, Education, Tenure:

+ = positive relationship (e.g. higher means for older groups)

- = negative relationship (e.g. lower means for more educated groups)

C - curvilinear relationship

Marital Status:

S - single group has highest mean

M - married group has highest mean

O - other group has highest mean

Group identification:

(1) - Vocational Rehabilitation Counselors

(2) - Retail Trade Workers I

(3) - Retail Trade Workers II

(4) - Vocational Rehabilitation Clients

2. Age was a factor in eleven MIQ scales. The older age groups tended to score higher on Ability Utilization, Achievement, Activity, Company Policies and Practices, Compensation, Moral Values, Supervision-Human Relations, and Working Conditions. A curvilinear trend was observed for Advancement, Authority, and Responsibility.
3. Education was a factor for seven scales and the TCT score. The more educated groups tended to score higher on Ability Utilization, Advancement, Creativity and Responsibility; while the less educated groups tended to score higher on Activity, Company Policies and Practices, Working Conditions, and the Total Circular Triads score.
4. The relationship of MIQ scale values and tenure was replicated for only one scale, Social Status, although significant differences were observed for eleven other scales. The trend for Social Status was curvilinear.
5. Marital status as a factor was found replicated for three scales: Company Policies and Practices, Co-workers, and Supervision-Human Relations. The "other" (separated, divorced, widowed) group tended to score highest on Company Policies and Practices, the single group on Co-workers, and the married group on Supervision-Human Relations. However, significant differences among marital status groups were observed for nineteen scales and the TCT score, the only exception being the Social Service scale.

In a related study, Gay and Weiss (1970) examined the relationship between MIQ scale values and amount of work experience (indicated by number of past jobs) for the group of 1,621 vocational rehabilitation clients. Using one-way analysis of variance, they found that: (1) persons with different amounts of work experience tended to have different levels of MIQ scale values; (2) the overall level of MIQ scale values differed with differing work experience; and (3) the TCT score tended to decrease with increasing work experience, suggesting an increase in the clarification of need structures.

A number of *post hoc* explanations might be advanced to account for the group differences observed and reported above. The more significant aspect of the findings, however, is simply the demonstration that differences in measured vocational needs are

reflected by the MIQ among groups which, there is good reason to believe, should be different. This "discriminating power" of the MIQ might be taken as additional evidence of its validity.

The data shown in Table 13 can be used to demonstrate validity for the MIQ which is based on the *Theory of Work Adjustment*. According to the theory, tenure in an occupation is in part a function of need-reinforcer correspondence (Corollary VIIIa). Thus we would expect members of an occupation to have MIQ profiles which correspond to the occupation's Occupational Reinforcer Pattern (ORP). Evidence supporting this expectation is given in Table 13, which lists mean MIQ scale values and the corresponding ORP values for the Vocational Rehabilitation Counselor, High School Counselor, and Retail Trade Workers I and II groups. The MIQ scale

**Table 13**  
Mean MIQ scale values and ORP values for  
four occupational groups, by scale

MIQ Scale	Vocational Rehabilitation Counselor		High School Counselor		Retail Trade Workers I and II		
	MIQ	ORP	MIQ	ORP	MIQ(I)	MIQ(II)	Salesperson ORP
AU	1.72	1.85	1.58	1.69	1.53	1.55	1.09
Ach	1.78	1.56	1.70	1.30	1.55	1.77	1.07
Act	.10	.87	-.02	1.03	.72	.82	1.21
Adv	1.29	.90	1.01	.30	1.60	1.57	.74
Au	-.08	-.55	-.47	-.44	.12	.05	-.11
CPP	1.00	.63	.92	.47	1.23	1.27	1.01
Com	.84	.36	.64	.04	1.38	1.23	.47
Cow	.62	.60	.73	.95	.70	.79	.86
Cre	1.31	1.58	1.32	1.27	1.13	1.13	.75
Ind	-.15	.81	-.47	.69	.24	.19	.30
MV	1.23	.64	1.40	.96	1.15	.85	.61
Rec	.93	.73	.69	.73	1.26	1.26	1.07
Res	1.28	1.86	1.19	1.43	1.08	1.14	.62
Sec	.60	.91	.59	.85	1.43	1.26	1.09
SSe	1.50	1.47	1.67	1.89	1.01	1.08	.88
SSt	-.18	.19	-.19	.57	.09	-.25	-.31
SHR	.90	.64	.67	.46	1.31	1.15	.77
ST	.69	.54	.23	.09	1.07	1.05	.85
Var	.44	1.26	.38	1.27	.62	.51	.68
WC	.71	.81	.74	1.00	1.24	1.31	1.07

rho (Vocational Rehabilitation Counselor MIQ and ORP) = .60

rho (High School Counselor MIQ and ORP) = .62

rho (Retail Trade Worker (I) MIQ and salesperson ORP) = .48

rho (Retail Trade Worker (II) MIQ and salesperson ORP) = .58

rho (Retail Trade Worker (I) MIQ and Retail Trade Worker (II) MIQ) = .94

values were taken from Table 11 while the ORP values were those given in Borgen, Weiss, Tinsley, Dawis and Lofquist, 1968a (pp. 63, 61, and 149). Need-reinforcer correspondence is indicated by Spearman rank-order correlation ( $\rho$ ) coefficients of .60, .62, .48 and .58 respectively for the four groups. It is also worth noting that the mean MIQ profiles for the two groups of Retail Trade Workers, obtained from two separate organizations, correlate .94, indicating a degree of generalizability in the use of the MIQ for the assessment of vocational needs and indicating likewise the validity of the *Theory of Work Adjustment*, specifically of Corollary VIIIa.

A validation study of the 1967 MIQ, based on the *Theory of Work Adjustment*, was conducted by Betz (1969). Using as subjects groups of cashiers, sales clerks and checker-markers in a retail-trade organization, she tested the proposition that "satisfaction is a function of the correspondence between the reinforcer system of the work environment and the individual's needs . . ." (Proposition III). As measures of reinforcer systems, Betz used the ORPs given in Borgen, et al. (1968a). To control for satisfactoriness (Proposition III adds " . . . provided that the individual's abilities correspond with the ability requirements of the work environment"), Betz limited her study only to persons who had been employed for at least twelve months. She found correlations between MIQ-ORP correspondence and job satisfaction (measured by the Minnesota Satisfaction Questionnaire) to be statistically significant for cashiers ( $r=.32$ ) and salesclerks ( $r=.45$ ), but not for checker-markers ( $r=.11$ ). "Hit rates" in the prediction of job satisfaction, calculated from dichotomization according to the median on MIQ-ORP correspondence and satisfaction, were .68 for cashiers and .73 for salesclerks. These hit rates represent improvements of 18% and 23%, respectively, beyond chance hit rates.

The data provided above give evidence that the MIQ functions as it was intended to function, that is, as a measure of vocational needs as defined in the *Theory of Work Adjustment*.

## References

- Betz, Ellen. Need-reinforcer correspondence as a predictor of job satisfaction. *Personnel and Guidance Journal*, 1969, 47, 878-883.
- Borgen, F.H., Weiss, D.J., Tinsley, H.E.A., Dawis, R.V., & Lofquist, L.H. Occupational Reinforcer Patterns (First Volume). *Minnesota Studies in Vocational Rehabilitation*, 1968, 24.(a)
- Borgen, F.H., Weiss, D.J., Tinsley, H.E.A., Dawis, R.V., & Lofquist, L.H. The Measurement of Occupational Reinforcer Patterns. *Minnesota Studies in Vocational Rehabilitation*, 1968, 25.(b)
- Dawis, R.V., England, G.W., & Lofquist, L.H. A theory of work adjustment. *Minnesota Studies in Vocational Rehabilitation*, 1964, 15.
- Dawis, R.V., Lofquist, L.H., & Weiss, D.J. A theory of work adjustment (A revision). *Minnesota Studies in Vocational Rehabilitation*, 1968, 23.
- DeWitt, L.H. and Weiss, D.J. Applications of circular triad data in individual measurement. *Proceedings, 77th Annual Meeting of the American Psychological Association*, 1969, 147-148.
- Edwards, A.L. *Techniques of attitude scale construction*. New York: Appleton, 1957.
- Fisher, S.T., Weiss, D.J., & Dawis, R.V. A comparison of Likert and pair comparison techniques in multivariate attitude scaling. *Educational and Psychological Measurement*, 1968, 28, 81-94.
- Gay, E.G. and Weiss, D.J. Relationship of work experience and measured vocational needs. *Proceedings, 78th Annual Convention of the American Psychological Association*, 1970, 663-664.
- Gibson, D.L., Weiss, D.J., Dawis, R.V., & Lofquist, L.H. Manual for the Minnesota Satisfactoriness Scales. *Minnesota Studies in Vocational Rehabilitation*, 1970, 27.
- Golden, R.R. & Weiss, D.J. Relationship of vocational satisfaction to the correspondence of job reinforcement and vocational needs. Research Report No. 11, Work Adjustment Project, University of Minnesota, August, 1968. (mimeographed)
- Guilford, J.P. *Psychometric Methods* (2nd ed.). New York: McGraw-Hill, 1954.



- Gulliksen, H. Intercultural studies of attitudes. In Fredericksen, N. and Gulliksen, H. (Eds). *Contributions to Mathematical Psychology*, New York: Holt, Rhinehart and Winston, 1964.
- Hendel, D.D., & Weiss, D.J. Individual inconsistency and reliability of measurement. *Educational and Psychological Measurement*, 1970, 30, 579-593. (a)
- Hendel, D.D., & Weiss, D.J. Relationship of race and demographic characteristics to vocational needs profiles. *Proceedings, 78th Annual Convention of the American Psychological Association*, 1970, 351-352. (b)
- Kendall, M.G. *Rank Correlation Methods*. New York: Hafner, 1955.
- Schaffer, R.H. Job satisfaction as related to need satisfaction in work. *Psychological Monographs*, 1953, No. 364.
- Taylor, K.E., & Weiss, D.J. Prediction of individual job turnover from measured job satisfaction. *Proceedings, 77th Annual Meeting of the American Psychological Association*, 1969, 587-588.
- Thorndike, R.M., Weiss, D.J., & Dawis, R.V. Canonical correlation of vocational interests and vocational needs. *Journal of Counseling Psychology*, 1968, 15, 101-106. (a)
- Thorndike, R.M., Weiss, D.J., & Dawis, R.V. Multivariate relationships between a measure of vocational interests and a measure of vocational needs. *Journal of Applied Psychology*, 1968, 52, 491-496. (b)
- United States Department of Labor. Manual for the General Aptitude Test Battery. Section II: Norms, Occupational Aptitude Pattern Structure, 1970. (a)
- United States Department of Labor. Manual for the General Aptitude Test Battery. Section III: Development, 1970. (b)
- Weiss, D.J., Dawis, R.V., England, G.W., & Lofquist, L.H. The measurement of vocational needs. *Minnesota Studies in Vocational Rehabilitation*, 1964, 16. (a)
- Weiss, D.J., Dawis, R.V., England, G.W., & Lofquist, L.H. Construct validation studies of the Minnesota Importance Questionnaire. *Minnesota Studies in Vocational Rehabilitation*, 1964, 18. (b)

- Weiss, D.J., Dawis, R.V., England, G.W., & Lofquist, L.H. An inferential approach to occupational reinforcement. *Minnesota Studies in Vocational Rehabilitation*, 1965, 19.
- Weiss, D.J., Dawis, R.V., Lofquist, L.H., & England, G.W. Instrumentation for the Theory of Work Adjustment. *Minnesota Studies in Vocational Rehabilitation*, 1966, 21.
- Weiss, D.J., Dawis, R.V., England, G.W., & Lofquist, L.H. Manual for the Minnesota Satisfaction Questionnaire. *Minnesota Studies in Vocational Rehabilitation*, 1967, 22.

## Appendixes

## Appendix A

### Directions

The purpose of this questionnaire is to find out what you consider **important** in your **ideal job**, the kind of job you would most like to have.

On the following pages you will find **pairs** of statements about work.

- Read each **pair** of statements carefully.
- Decide which statement of the **pair** is **more** important to you in your **ideal** job.
- For each pair mark your choice on the answer sheet. **Do not mark this booklet.** (Directions on how to mark the answer sheet are given below.)

Do this for **all** pairs of statements. Work as rapidly as you can. Read each pair of statements, mark your choice, then move on to the next pair. Be sure to make a choice for **every** pair. **Do not** go back to change your answer to any pair.

Remember: You are to decide which statement of the pair is **more important** to **you** in your **ideal** job. Mark your choice on the answer sheet, **not** on this booklet.

### How to Mark the Answer Sheet

#### First of all

Print your name in the space provided, and fill in the other information requested.

#### To fill in the answer sheet

Start where it is marked "Page 1."

There is a box for each pair of statements. The number in the middle of the box is the number of that pair. "a" and "b" in the box stand for the two statements of the pair.

If you think statement "a" is more important to you than statement "b", mark an "X" over the "a" on the answer sheet, as shown in the example below:

page 1	a	a	a
	1	2	3
	b	b	b

However, if you think statement "b" is more important to you than statement "a", mark an "X" over the "b" on the answer sheet, as shown in the example below:

page 1	a	a	a
	1	2	3
	b	b	b

#### Mark Only One Answer for Each Pair of Statements.

Mark **either** "a" or "b" for each pair. **Do this for all pairs of statements.** Remember, **do not** mark your answer on this booklet. Use the answer sheet.

# MANUAL FOR THE MINNESOTA IMPORTANCE QUESTIONNAIRE

Ask yourself: Which is **more important** to me in my **ideal** job?

1. a. I could be busy all the time.  
OR  
b. The job would provide an opportunity for advancement.
2. a. I could try out some of my own ideas.  
OR  
b. My co-workers would be easy to make friends with.
3. a. The job could give me a feeling of accomplishment.  
OR  
b. I could do something that makes use of my abilities.
4. a. The company would administer its policies fairly.  
OR  
b. I could be busy all the time.
5. a. I could try out some of my own ideas.  
OR  
b. I could be "somebody" in the community.
6. a. The job would provide an opportunity for advancement.  
OR  
b. My co-workers would be easy to make friends with.
7. a. I could tell people what to do.  
OR  
b. I could work alone on the job.
8. a. I could get recognition for the work I do.  
OR  
b. The company would administer its policies fairly.
9. a. My co-workers would be easy to make friends with.  
OR  
b. The job would provide for steady employment.
10. a. The job could give me a feeling of accomplishment.  
OR  
b. The job would provide an opportunity for advancement.
11. a. My boss would train his men well.  
OR  
b. I could work alone on the job.
12. a. I could do the work without feeling that it is morally wrong.  
OR  
b. The job would have good working conditions.

# Appendix B

Table B-1

Cumulative percents for adjusted scale values for MIQ vocational need scales  
(Total group: N = 5,358)

Ad-justed scale value	AU	Ach	Act	Adv	Au	CPP	Com	Cow	Cre	Ind	MV	Rec	Res	Sec	SSe	SSt	SHR	ST	Var	WC	TCT Range	TCT Cumula- tive percent
4.0	100	100		100	100	100	100		100	100	100	100	100	100	100	100	100	100		100	255-385	100
3.5	99	99		99	99	99	99	100	99	99	99	99	99	99	99	99	99	99	100	99	250-254	96
3.2	99	99	100	98	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	245-249	96
3.0	98	98	99	97	99	99	98	99	99	99	98	99	99	98	98	99	99	99	99	99	240-244	96
2.8	95	96	99	95	99	99	97	99	99	99	96	98	99	96	97	99	98	99	99	98	235-239	96
2.7	94	95	99	93	99	98	97	99	98	99	94	98	98	95	96	99	98	99	99	98	230-234	95
2.6	92	93	99	91	99	97	96	99	97	99	93	97	98	94	95	99	97	98	99	97	225-229	95
2.5	91	92	99	90	99	97	95	99	97	99	91	97	97	93	94	99	97	98	99	97	220-224	95
2.4	88	88	98	87	99	96	94	99	96	98	88	95	96	90	92	99	95	97	98	96	215-219	94
2.3	86	86	98	85	99	95	93	98	95	98	87	94	95	88	90	98	95	96	98	95	210-214	94
2.2	83	83	98	83	99	94	92	98	94	98	86	93	94	87	89	98	94	96	98	94	205-209	94
2.1	79	79	97	80	99	93	90	98	92	98	84	92	92	84	87	98	92	95	97	92	200-204	93
2.0	76	76	96	77	98	91	88	97	90	97	82	90	91	82	85	98	91	94	96	91	195-199	93
1.9	68	68	94	71	98	87	84	96	86	96	79	86	88	77	81	97	88	91	94	86	190-194	92
1.8	67	66	93	69	97	86	83	94	85	95	78	84	86	75	79	96	86	90	93	85	185-189	92
1.7	59	57	91	63	96	83	70	92	81	94	75	80	82	71	75	96	84	88	92	81	180-184	91
1.6	55	54	90	60	96	81	76	91	79	94	73	77	80	68	72	95	82	86	90	78	175-179	91
1.5	46	44	87	53	95	75	72	88	73	92	70	71	74	63	67	93	77	82	87	73	170-174	90
1.4	43	41	85	50	94	72	69	86	69	91	67	69	72	60	65	92	74	79	85	70	165-169	89
1.3	36	33	82	43	92	66	65	82	63	88	63	63	66	55	59	91	69	75	82	64	160-164	89
1.2	32	30	79	40	91	62	62	79	59	87	61	59	62	52	56	89	66	71	79	60	155-159	87
1.1	26	24	75	34	89	57	57	74	53	84	57	54	56	47	51	87	62	66	75	54	150-154	87
1.0	22	20	72	31	88	51	53	70	48	82	54	50	51	43	47	85	57	62	72	50	145-149	86
.9	17	14	66	26	85	43	47	63	41	78	50	43	44	37	41	82	50	54	67	43	140-144	85
.8	14	12	62	22	84	39	43	58	37	76	47	38	39	34	37	80	45	49	64	38	135-139	84
.7	11	9	57	18	81	33	38	53	32	73	43	33	34	29	33	77	39	44	60	33	130-134	82

(continued on next page)

Table B-1 (continued)

Cumulative percents for adjusted scale values for MIQ vocational need scales  
(Total group: N = 5,358)

Ad- justed scale value	AU	Ach	Act	Adv	Au	CPP	Com	Cow	Cre	Ind	MV	Rec	Res	Sec	SSe	SSt	SHR	ST	Var	WC	TCT Range	TCT Cumula- tive percent
.6	9	7	52	16	78	28	33	47	28	70	38	29	30	26	28	74	34	39	55	28	125-129	81
.5	6	5	46	13	75	22	28	39	24	66	34	23	24	21	24	71	28	32	50	23	120-124	80
.4	5	4	42	10	73	18	25	34	21	62	30	21	21	18	20	67	24	27	47	19	115-119	78
.3	4	3	36	8	69	14	21	27	17	58	26	17	17	15	16	63	20	22	41	15	110-114	76
.2	3	2	34	7	67	12	19	24	15	55	24	15	14	13	14	60	17	19	38	12	105-109	74
.1	2	1	29	5	62	9	15	19	12	49	19	12	12	10	11	55	14	14	33	9	100-104	72
0.0	1	1	26	4	61	7	13	16	11	48	18	10	10	9	9	54	12	12	31	7	95-99	70
-.1	0	0	21	3	53	4	10	11	8	40	14	7	7	6	7	48	9	9	24	5	90-94	67
-.2			19	2	51	4	9	10	7	39	13	6	6	6	6	47	8	8	22	4	85-89	65
-.3			15	2	45	3	7	7	5	33	11	4	4	4	4	42	6	6	17	3	80-84	61
-.4			14	1	42	2	6	6	4	30	9	4	3	4	4	39	5	5	15	2	75-79	58
-.5			11	1	37	1	5	4	3	26	8	3	2	3	3	35	4	4	11	2	70-74	54
-.6			9	0	32	1	4	3	2	21	6	2	1	2	2	30	3	3	9	1	65-69	50
-.7			7		28	1	3	2	2	19	5	1	1	2	1	27	2	2	6	1	60-64	46
-.8			5		23	0	2	1	1	15	4	1	0	1	1	23	1	2	4	0	55-59	41
-.9			4		20		1	1	1	12	4	0		1	1	20	1	1	3		50-54	37
-1.0			3		17		1	1	0	10	3			1	1	17	1	1	2		45-49	32
-1.1			2		12		0	0		7	2			0	0	12	0	0	1		40-44	27
-1.2			2		10					6	2					11			1		35-39	21
-1.3			1		8					4	1					8			1		30-34	16
-1.4			1		7					3	1					7			0		25-29	11
-1.5			1		4					1	1					4					20-24	8
-1.6			0		2					1	0					2					15-19	4
-1.7					1					0						1					10-14	2
-1.8					1											1					5-9	0
-1.9					0											0					0-4	0

Table B-2

Cumulative percents for adjusted scale values for MIQ vocational need scales  
(DVR group: N = 1,621)

Ad- justed scale value	AU	Ach	Act	Adv	Au	CPP	Com	Cow	Cre	Ind	MV	Rec	Res	Sec	SSe	SSt	SHR	ST	Var	WC	TCT Range	TCT Cumulative percent
4.0	100	100		100	100				100	100		100	100	100	100	100		100			255-385	100
3.5	99	99		99	99	100	100	100	99	99	100	99	99	99	99	99	100		100		250-254	96
3.2	98	99	100	98	99	99	99	99	99	99	99	99	99	98	99	99	99	99	100	99	245-249	95
3.0	97	98	99	99	99	99	99	99	99	99	99	99	99	97	98	99	99	99	99	99	240-244	95
2.8	94	96	99	95	99	99	99	99	99	99	98	98	98	99	95	97	99	99	99	99	235-239	95
2.7	92	95	99	94	99	99	98	99	98	99	97	98	98	95	96	99	99	99	99	99	230-234	94
2.6	90	93	99	92	99	99	98	99	98	98	96	98	98	93	95	99	99	99	99	98	225-229	94
2.5	89	92	99	91	99	98	98	99	97	98	95	97	97	92	94	99	98	98	98	98	220-224	94
2.4	85	88	98	88	99	98	97	99	96	98	93	96	96	89	91	98	97	98	98	97	215-219	93
2.3	83	86	97	87	99	97	97	98	95	97	92	95	95	87	90	98	97	97	97	97	210-214	93
2.2	80	84	97	85	99	96	96	98	95	97	91	95	95	85	89	98	97	96	97	96	205-209	92
2.1	76	80	96	82	99	96	95	98	93	96	90	93	93	83	87	97	96	95	95	95	200-204	92
2.0	73	77	95	79	98	94	93	97	92	96	88	92	91	80	85	97	95	94	95	93	195-199	91
1.9	66	70	93	72	98	92	91	95	89	94	86	89	88	73	81	96	93	92	93	90	190-194	91
1.8	64	69	92	70	97	91	90	94	87	92	85	87	87	72	80	95	92	90	91	89	185-189	90
1.7	56	61	89	64	96	89	86	92	84	91	83	85	84	67	75	94	90	88	90	85	180-184	89
1.6	52	58	88	61	96	87	84	91	82	90	81	82	82	64	73	93	89	86	89	82	175-197	89
1.5	44	48	85	56	94	83	81	88	77	88	78	76	78	59	68	91	86	82	86	76	170-174	88
1.4	41	43	82	53	94	81	79	85	74	86	76	74	75	56	66	90	84	80	84	73	165-165	81
1.3	34	35	79	46	93	75	75	82	69	83	72	68	70	50	61	88	80	76	80	66	160-164	86
1.2	31	32	76	42	92	72	72	79	65	81	70	64	65	47	58	86	78	73	77	62	155-159	86
1.1	26	27	72	37	90	66	66	75	62	78	66	58	61	41	53	84	74	68	74	55	150-154	84
1.0	22	23	69	33	89	61	62	70	58	76	63	54	57	37	48	82	70	63	70	50	145-149	83
.9	17	17	63	28	86	52	56	64	53	72	58	48	50	31	42	78	64	55	65	44	140-144	82
.8	14	14	61	24	85	48	52	59	48	69	55	42	46	28	38	76	59	50	63	38	135-139	81
.7	11	12	56	20	83	42	46	54	43	66	51	38	42	23	33	72	52	45	60	33	130-134	80
.6	9	9	51	17	81	37	41	48	40	62	47	33	38	20	29	69	47	39	57	28	125-129	78

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Table B-2 (continued)

Cumulative percents for adjusted scale values for MIQ vocational need scales  
(DVR group: N = 1,621)

Ad- justed scale value	AU	Ach	Act	Adv	Au	CPP	Com	Cow	Cre	Ind	MV	Rec	Res	Sec	SSe	SSt	SHR	ST	Var	WC	TCT Range	TCT Cumulative percent
.5	7	7	45	14	78	31	35	41	35	59	42	27	32	16	25	65	40	31	53	23	120-124	76
.4	5	6	41	12	76	26	31	35	32	55	38	24	29	13	22	62	35	27	50	19	115-119	75
.3	4	4	35	9	74	20	26	28	27	50	33	20	24	10	18	57	29	22	45	13	110-114	73
.2	3	3	32	7	72	17	24	24	24	48	30	18	21	8	16	54	25	18	42	10	104-109	71
.1	2	2	28	6	69	13	19	20	20	42	26	15	17	6	13	51	20	14	38	8	100-103	71
0.0	1	2	35	5	67	10	17	17	19	40	24	12	15	4	11	49	18	11	36	6	95-99	70
-.1	0	1	20	4	60	7	13	12	14	34	20	9	12	3	8	45	13	8	29	4	90-94	63
-.2		0	18	3	58	6	12	11	12	32	18	8	10	2	7	43	11	6	28	3	85-89	61
-.3			15	2	52	4	9	9	10	27	15	6	7	2	6	39	9	5	22	2	80-84	57
-.4			13	2	49	3	8	7	8	24	13	5	5	1	5	37	8	4	20	2	75-79	54
-.5			10	1	44	2	6	6	6	21	11	4	4	1	4	33	6	3	16	1	70-74	51
-.6			8	0	38	2	5	5	5	17	9	3	3	1	3	29	5	2	13	1	75-69	48
-.7			7		35	1	3	3	4	14	8	2	2	1	2	27	4	2	10	0	60-64	43
-.8			5		30	1	2	2	2	12	7	1	1	0	2	24	2	1	7		55-59	39
-.9			4		26	0	2	2	2	10	6	1	0		1	20	2	1	6		50-54	35
-1.0			3		23		1	1	1	8	5	0			1	18	2	0	4		45-49	30
-1.1			2		17		1	1	0	5	4				1	13	1		3		40-44	25
-1.2			2		15		0	1		4	3				1	11	0		2		35-39	19
-1.3			1		12			0		3	3				0	9			1		30-34	15
-1.4			1		10					2	2					8			0		25-29	10
-1.5			0		6					1	2					5					20-24	7
-1.6					4					1	1					3					15-19	4
-1.7					2					1	1					2					10-14	2
-1.8					2					0	0					2					5-9	1
-1.9					1											1					0-4	0
-2.0					0											0						
-2.1																						

Table B-3

Cumulative percents for adjusted scale values for MIQ vocational need scales  
(Vocational technical school women: N = 285)

Ad- justed scale value	AU	Ach	Act	Adv	Au	CPP	Com	Cow	Cre	Ind	MV	Rec	Res	Sec	SSe	SSt	SHR	ST	Var	WC	TCT Range	TCT Cumulative percent
4.0	100			100						100		100	100		100						255-385	100
3.5	99	100		99						99	100	99	99	100	99						250-254	98
3.2	98	98		99						99	99	99	98	97	99				100		245-249	97
3.0	96	97	100	99		100		100	100	99	99	98	98	98	95		100		99	100	240-244	97
2.8	91	96	99	98		99		99	99	99	99	98	98	96	91	100	99		99	99	235-239	97
2.7	89	95	98	96		99	100	99	99	99	99	97	98	96	89	99	99		99	98	230-234	96
2.6	85	91	98	94	100	99	99	99	99	98	98	97	98	95	87	99	99		99	98	225-229	96
2.5	83	91	98	94	99	98	98	99	98	98	98	97	98	94	85	99	99		99	98	220-224	96
2.4	79	87	97	89	99	98	98	99	98	98	97	96	98	90	78	98	99		98	98	215-219	95
2.3	76	83	96	85	99	98	97	99	98	98	97	95	98	89	77	98	99		98	98	210-214	95
2.2	73	78	95	83	99	98	97	99	97	98	96	94	97	87	75	98	99	100	98	97	205-209	94
2.1	68	70	94	80	99	96	96	97	96	98	96	93	96	81	71	98	97	99	97	96	200-204	94
2.0	65	68	93	77	99	95	95	96	94	97	95	92	95	78	69	97	97	98	96	95	195-199	94
1.9	57	57	91	67	99	92	95	94	91	96	94	87	92	73	64	97	96	96	92	90	190-194	93
1.8	57	56	89	66	98	90	93	94	89	95	92	86	92	71	62	97	95	95	91	86	185-189	93
1.7	46	47	87	60	98	88	90	89	85	95	87	82	88	65	56	96	94	93	85	82	180-184	93
1.6	42	43	84	57	98	85	90	88	83	94	86	79	86	61	51	95	93	91	84	77	175-179	92
1.5	33	31	79	48	98	82	86	83	78	91	82	75	81	53	45	93	89	90	79	68	170-174	90
1.4	30	29	77	45	97	78	84	81	77	90	80	71	80	50	41	92	87	87	77	64	165-169	89
1.3	24	22	73	35	96	72	80	75	73	88	74	68	76	45	36	91	84	83	74	55	160-164	89
1.2	21	20	69	31	95	69	76	70	70	87	71	63	74	41	33	88	80	80	71	50	155-159	88
1.1	17	16	65	28	94	63	72	64	65	83	66	59	69	36	28	86	77	77	64	42	150-154	86
1.0	13	12	60	24	94	57	69	58	60	79	62	45	62	31	25	84	74	74	60	36	149-149	85
.9	10	8	53	20	92	48	63	50	52	76	57	44	57	27	24	81	65	63	53	31	140-144	83
.8	9	6	49	15	91	42	57	47	48	72	51	41	51	23	20	78	62	53	46	24	135-139	82
.7	7	2	45	12	90	35	52	43	43	66	46	37	45	17	17	75	57	46	42	21	130-134	81

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Table B-3 (continued)

Cumulative percents for adjusted scale values for MIQ vocational need scales  
(Vocational technical school women: N = 285)

Ad- justed scale value	AU	Ach	Act	Adv	Au	CPP	Com	Cow	Cre	Ind	MV	Rec	Res	Sec	SSe	SSt	SHR	ST	Var	WC	TCT Range	TCT Cumulative percent
.6	5	1	38	10	89	28	48	40	41	61	41	34	41	13	15	72	50	41	39	14	125-129	79
.5	3	0	29	7	86	21	43	29	35	56	35	29	32	10	12	68	40	35	34	9	120-124	77
.4	1		24	5	84	17	37	24	30	26	29	25	32	9	10	63	34	30	31	7	115-119	74
.3	1		19	4	81	11	32	16	25	47	24	19	26	6	8	58	24	22	27	4	110-114	72
.2	1		16	3	80	10	30	15	22	44	21	16	24	5	6	54	21	18	24	3	105-109	69
.1	0		12	3	74	6	23	11	19	38	16	12	21	4	6	48	18	12	21	3	100-104	66
0.0			11	1	73	4	20	10	18	36	15	10	18	3	5	47	16	10	19	2	95-99	64
-.1			7	1	66	2	17	6	12	27	12	5	13	2	4	40	12	7	15	1	90-94	60
-.2			6	1	64	1	16	5	11	27	10	4	11	1	4	37	10	5	14	1	85-89	56
-.3			6	1	57	1	12	3	8	20	8	3	8	1	3	31	7	3	9	1	80-84	53
-.4			5	1	52	1	12	3	6	19	5	2	7	0	3	28	6	2	8	1	75-79	51
-.5			2	0	45	0	9	2	3	15	4	2	4		2	24	5	2	4	1	70-74	46
-.6			1		35		6	2	2	12	3	1	3		1	22	4	1	4	0	65-69	41
-.7			1		35		4	1	2	9	2	1	3		1	20	4	2	1		60-64	37
-.8			1		28		3	1		6	2	1	2		1	16	2	1	1		55-59	33
-.9			1		23		2	0	1	5	2	0	2		1	14	2	0	1		50-54	28
-1.0			1		19		1		1	5	2		1		1	13	2		1		45-49	22
-1.1			0		12		1		0	3	1		0		1	9	1		1		40-44	16
-1.2					11		1			2	1				1	8	1		1		35-39	13
-1.3					11		1			2	1				0	4	1		1		30-34	9
-1.4					8		1			1	1					4	0		0		25-29	6
-1.5					4		1			0	0					1					20-24	3
-1.6					2		0									1					15-19	1
-1.7					2											1					10-14	0
-1.8					1											0					5-9	0
-1.9					0																0-4	0

Table B-4

Cumulative percents for adjusted scale values for MIQ vocational need scales  
(College students: N = 419)

Ad- justed scale value	AU	Ach	Act	Adv	Au	CPP	Com	Cow	Cre	Ind	MV	Rec	Res	Sec	SSe	SSt	SHR	ST	Var	WC	TCT Range	Cumulative percent
4.0		100													100						255-385	100
3.5	100	99					100			100					99						250-254	100
3.2	99	99					99	100	100		99	100			99					100	245-250	100
3.0	99	99		99			99	99	99		99	99	100		99					99	240-244	100
2.8	98	97		97	100	100	99	99	99		97	99	99	100	98	100				99	235-239	100
2.7	97	97		97	99	99	99	99	97		94	99	99	99	97	99				99	230-234	100
2.6	97	96		97	99	99	99	99	97		93	98	99	99	96	99			100	99	225-229	100
2.5	96	95	100	96	99	99	99	99	96	100	89	98	98	99	94	99				99	220-224	99
2.4	94	93	99	94	99	98	98	99	94	99	83	98	97	99	90	98				99	215-219	99
2.3	93	92	99	93	99	98	98	98	94	99	78	98	97	98	88	99				99	210-214	99
2.2	90	89	99	92	99	98	98	98	93	99	75	97	96	98	87	98	100			98	205-209	99
2.1	88	86	99	91	99	98	97	96	91	99	73	97	94	97	83	98	99	100		97	200-204	99
2.0	85	83	99	89	98	97	97	96	89	98	70	96	93	97	80	97	99	99	95	99	195-199	99
1.9	77	76	99	85	98	94	95	94	86	98	65	95	89	95	76	96	99	99	94	99	190-194	99
1.8	76	74	99	83	97	94	95	93	84	98	63	94	88	95	75	96	98	99	94	98	185-189	99
1.7	71	64	98	80	97	89	94	91	79	98	61	92	83	94	71	96	97	99	93	98	180-184	99
1.6	67	59	98	78	96	87	93	90	78	98	59	91	82	92	69	95	97	99	91	98	175-179	99
1.5	58	49	98	73	96	83	91	87	71	97	54	89	76	90	65	93	94	98	89	96	170-174	98
1.4	52	45	97	70	95	82	89	85	68	97	53	87	74	89	63	93	93	97	88	95	165-169	98
1.3	42	35	96	62	93	77	81	61	61	95	50	82	68	86	59	90	91	96	85	92	160-164	98
1.2	38	35	95	57	93	74	83	78	56	94	48	78	64	84	56	90	89	94	83	90	155-159	97
1.1	29	30	93	50	92	70	79	73	49	92	46	75	58	79	53	88	85	92	80	87	150-154	97
1.0	26	25	92	46	90	66	77	70	44	90	42	69	53	76	49	88	83	90	78	83	145-149	97
.9	19	17	89	39	89	58	71	65	36	89	40	62	42	71	44	86	75	86	73	76	140-144	97
.8	15	13	88	32	87	51	67	59	32	88	38	57	38	66	41	85	70	80	71	72	135-139	96
.7	12	10	84	26	85	46	62	55	25	86	26	53	32	62	36	82	63	77	68	65	130-134	96
.6	8	8	82	24	83	39	58	48	20	84	31	48	28	59	33	80	59	73	64	59	125-129	94

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Table B-4 (continued)

Cumulative percents for adjusted scale values for MIQ vocational need scales  
(College students: N = 419)

Ad- justed scale value	AU	Ach	Act	Adv	Au	CPP	Com	Cow	Cre	Ind	MV	Rec	Res	Sec	SSe	SSt	SHR	ST	Var	WC	TCT Range	TCT Cumulative percent
.5	5	4	78	18	79	32	52	42	15	82	29	41	21	53	30	78	54	64	57	51	120-124	94
.4	3	3	74	15	77	27	49	37	12	78	26	37	15	48	26	76	49	58	53	44	115-119	93
.3	1	2	70	13	75	20	43	31	8	76	24	31	14	43	23	71	43	51	48	36	110-114	92
.2	1	1	69	11	72	16	41	26	6	73	21	29	12	41	21	68	38	45	45	31	105-109	91
.1	1	0	64	9	67	14	35	22	5	70	19	25	11	35	19	64	33	37	40	27	100-104	89
0.0	1		61	7	65	12	31	18	4	68	18	21	9	32	15	63	29	33	28	22	95-99	88
-.1	1		55	5	59	9	26	14	3	61	16	15	7	25	12	57	22	26	34	16	90-94	86
-.2	0		52	4	57	8	24	12	2	58	15	13	6	23	11	56	20	23	29	13	85-89	85
-.3			45	3	52	6	21	9	2	53	13	10	4	20	9	50	17	20	23	10	80-84	82
-.4			42	2	50	4	20	7	2	49	12	9	4	18	9	47	14	17	21	9	75-79	79
-.5			36	1	46	3	15	6	2	44	10	6	2	14	7	42	10	14	16	7	70-74	75
-.6			31	1	42	3	14	4	2	38	10	5	1	12	6	40	8	12	13	5	65-69	73
-.7			27	1	36	2	10	3	0	35	8	3	1	10	4	34	5	8	9	3	60-64	69
-.8			22	0	30	1	7	3		30	6	3	1	9	3	29	3	6	7	3	55-59	66
-.9			18		26	1	6	2		26	6	2	1	6	2	26	1	4	6	2	50-54	61
-1.0			15		22	0	4	1		22	5	1	0	5	2	23	0	4	5	1	45-49	56
-1.1			12		16		3	1		15	4	0		4	1	17		3	4	1	40-44	49
-1.2			9		13		3	0		13	3			3	1	14		2	3	1	35-39	44
-1.3			8		11		1			11	3			2	1	12		2	2	1	30-34	37
-1.4			7		10		1			10	2			1	1	10		1	2	0	25-29	29
-1.5			5		7		1			6	2			1	0	7		1	1		20-24	21
-1.6			3		5		0			3	2			0		4		1	1		15-19	13
-1.7			3		5					3	2					4		1	1		10-14	7
-1.8			2		2					1	1					2		0	0		5-9	4
-1.9			1		1					1	1					1					0-4	0
-2.0			0		0					1	0					0						
-2.1										0												

Table B-5

Cumulative percents for adjusted scale values for MIQ vocational need scales  
(Employed group: N = 3,033)

Ad- justed scale value	AU	Ach	Act	Adv	Au	CPP	Com	Cow	Cre	Ind	MV	Rec	Res	Sec	SSe	SSSt	SHR	ST	Var	WC	TCT Range	TCT Cumulative percent
4.0	100	100		100		100	100		100		100	100	100	100	100		100	100		100	255-285	100
3.5	99	99		99	100	99	99		99	100	99	99	99	99	99		99	99	100	99	250-254	96
3.2	99	99		98	99	99	98	100	99	99	98	99	99	99	99	100	99	99	99	99	245-249	96
3.0	98	98	100	96	99	99	98	99	99	99	97	99	99	98	99	99	98	99	99	99	240-244	96
2.8	96	96	99	94	99	98	96	99	98	99	94	98	99	96	98	99	98	99	99	98	235-239	95
2.7	95	95	99	92	99	97	95	99	98	99	92	97	98	95	97	99	97	98	99	97	230-234	95
2.6	93	93	99	90	99	96	94	99	97	99	91	97	98	93	96	99	96	98	99	97	225-229	95
2.5	92	92	99	89	99	96	93	99	97	99	89	96	97	92	95	99	95	98	99	96	220-224	94
2.4	89	88	99	86	99	94	91	99	95	99	86	94	95	89	93	99	93	97	99	94	215-219	94
2.3	87	85	98	84	99	93	89	98	94	99	84	93	94	88	92	99	92	96	98	93	210-214	94
2.2	84	83	98	81	99	92	88	98	93	99	83	92	93	86	91	99	91	95	98	92	205-209	93
2.1	80	78	98	77	99	90	85	98	91	98	81	90	92	83	89	98	89	93	98	89	200-204	93
2.0	77	76	97	75	98	89	83	97	88	98	80	88	90	81	87	98	87	92	97	87	195-199	93
1.9	69	66	95	68	97	83	78	96	85	97	76	83	87	76	83	98	83	89	95	83	190-194	92
1.8	68	65	94	67	97	82	77	95	83	97	74	81	85	75	81	97	81	88	94	81	185-189	92
1.7	60	56	92	61	96	78	72	93	79	96	71	76	81	70	77	97	77	85	93	77	180-184	91
1.6	56	52	91	58	96	76	69	92	76	95	70	73	79	68	74	96	74	83	92	74	175-179	90
1.5	47	43	88	50	94	69	63	89	70	93	66	66	72	62	69	95	69	79	89	68	170-174	90
1.4	44	40	86	47	93	66	60	87	66	92	64	63	69	60	67	94	66	76	87	66	165-169	89
1.3	37	33	82	40	91	59	55	82	59	90	60	57	63	54	61	92	59	70	83	60	160-164	88
1.2	33	29	79	37	90	55	52	80	54	89	57	54	58	51	58	90	56	66	80	56	155-159	87
1.1	27	23	75	32	88	49	47	75	48	87	54	49	52	47	53	89	50	61	76	51	150-154	86
1.0	23	19	72	29	86	44	43	71	43	84	50	44	47	42	48	87	45	56	73	46	145-149	85
.9	18	13	65	24	84	36	37	64	35	81	46	38	39	37	42	84	38	49	68	39	140-144	85
.8	14	10	61	21	82	32	33	59	31	78	43	33	35	33	38	82	33	44	65	35	135-139	84

(continued on next page)

**Table B-5 (continued)**  
**Cumulative percents for adjusted scale values for MIQ vocational need scales**  
**(Employed group: N = 3,033)**

Ad- justed scale value	AU	Ach	Act	Adv	Au	CPP	Com	Cow	Cre	Ind	MV	Rec	Res	Sec	SSe	SSt	SHR	ST	Var	WC	TCT Range	TCT Cumulative percent
.7	12	8	56	17	79	27	29	52	26	75	39	28	29	29	33	79	27	39	60	30	130-134	82
.6	10	6	50	14	76	22	25	47	22	72	35	24	25	25	28	76	22	34	55	26	125-129	81
.5	7	4	43	12	72	17	20	39	18	68	30	19	19	21	23	73	17	27	50	20	120-124	80
.4	5	3	40	10	70	14	17	34	15	65	27	16	16	18	19	69	15	23	46	17	115-119	78
.3	4	2	34	7	65	10	14	27	12	60	23	12	12	15	14	65	11	18	40	13	110-114	76
.2	3	2	31	6	62	9	12	24	10	57	21	11	11	13	12	62	10	16	36	11	105-109	74
.1	2	1	26	5	57	6	9	18	8	51	16	8	8	10	9	57	8	12	30	8	100-104	72
0.0	1	1	24	4	55	5	8	15	7	50	15	7	7	9	8	56	6	10	28	6	95-99	70
-.1	0	0	18	3	47	3	5	10	5	42	11	5	4	6	6	49	5	7	21	4	90-94	67
-.2			17	2	46	2	5	9	4	41	10	4	3	5	4	48	4	6	20	4	85-89	64
-.3			13	2	39	2	3	7	3	34	8	3	2	4	3	43	3	5	14	3	80-84	61
-.4			11	1	36	1	3	6	3	31	7	2	2	3	2	40	2	4	12	2	75-79	58
-.5			8	1	31	1	2	4	2	27	6	2	1	2	1	36	2	3	8	1	70-74	54
-.6			6	1	26	0	2	3	1	22	5	1	1	2	1	31	1	2	6	1	65-69	50
-.7			5		23		1	2	1	20	4	1	0	1	1	27	1	2	5	0	60-64	45
-.8			4	0	18		1	1	0	15	3	0		1	1	23	0	1	3		55-59	40
-.9			3		15		0	1		12	2			1	0	19		1	2		50-54	35
-1.0			2		12			0		10	2			0		17		1	1		45-49	21
-1.1			1		8					7	1					11		0	0		40-44	26
-1.2			1		7					6	1					10					35-39	20
-1.3			1		5					3	1					7					30-34	15
-1.4			0		4					3	0					6					25-29	10
-1.5					2					1						3					20-24	7
-1.6					1					0						2					15-19	4
-1.7					0											1					10-14	2
-1.8																0					5-9	0

# Appendix C

**Table C-1**  
**Distribution of D<sup>2</sup> (cumulative percents) of D<sup>2</sup>**  
**for five occupations on own ORP<sup>1</sup>**

D <sup>2</sup>	Occupations					D <sup>2</sup>	Occupations				
	VRC	C	M	S	PSC		VRC	C	M	S	PSC
4.75			2	1		14.00	46	46	62	60	50
6.00			4	2	1	14.25	48	46	62	62	51
6.50	1		6	5	2	14.50	50	50	62	65	53
6.75	2		6	7	2	14.75	54	51	64	65	55
7.00	2		12	8	2	15.00	56	54	66	65	56
7.25	2		12	10	3	15.25	57	54	68	65	58
7.50	3	1	12	10	3	15.50	59	58	70	66	62
7.75	4	4	14	10	3	15.75	61	59	72	66	63
8.00	5	4	18	11	4	16.00	62	62	75	66	63
8.25	6	4	20	11	4	16.25	63	62	75	69	66
8.50	7	4	22	13	5	16.50	64	62	75	69	68
8.75	8	8	25	18	6	16.75	65	64	77	72	70
9.00	9	8	27	18	8	17.00	66	67	77	72	72
9.25	10	8	29	21	8	17.25	68	70	77	73	73
9.50	10	11	29	24	10	17.50	69	70	77	75	74
9.75	13	12	31	28	10	17.75	69	70	81	76	75
10.00	15	14	32	33	16	18.00	70	70	83	78	76
10.25	18	16	33	36	16	18.25	71	70	85	79	76
10.50	20	19	35	36	20	18.50	72	70	85	81	76
10.75	22	20	37	37	21	18.75	74	74	85	82	76
11.50	25	22	43	37	23	19.00	75	74	85	84	78
11.75	30	25	43	44	30	19.25	76	74	85	86	82
12.00	32	29	43	46	32	19.50	76	75	85	86	83
12.25	34	29	43	49	35	19.75	77	75	85	86	84
12.50	36	30	45	50	38	20.00	78	77	85	86	87
12.75	38	35	45	50	39	20.25	79	79	85	86	87
13.00	40	38	45	52	42	20.50	80	79	85	86	87
13.25	42	41	47	56	47	20.75	81	79	85	86	87
13.50	44	41	54	56	48	21.00	83	79	85	86	88
13.75	45	46	56	59	49	21.25	83	79	85	86	89



**Table C-1 (continued)**  
**Distribution of  $D^2$  (cumulative percents) of  $D^2$**   
**for five occupations on own ORP<sup>1</sup>**

$D^2$	Occupations					$D^2$	Occupations				
	VRC	C	M	S	PSC		VRC	C	M	S	PSC
21.50	84	79	87	88	90	30.00	94	87	100	94	98
21.75	86	79	87	91	91	30.25	95	87		94	99
22.00	87	79	89	91	92	31.75	95	87		94	99
22.25	88	79	89	91	93	32.50	95	87		95	99
22.75	89	79	89	91	93	32.75	95	87		95	99
23.00	89	80	89	91	93	33.25	96	88		95	99
23.25	89	80	89	91	93	33.50	97	88		95	99
23.50	89	82	89	92	94	33.75	97	90		95	99
23.75	90	82	89	92	94	34.50	97	91		95	99
24.00	90	82	89	94	95	35.25	97	93		95	99
24.50	90	82	89	94	95	37.25	97	95		95	99
24.75	91	82	89	94	96	38.50	97	96		95	100
25.00	91	82	89	94	97	38.75	97	96		95	
25.50	92	82	89	94	97	40.00	98	96		97	
25.75	92	82	89	94	98	41.25	98	96		97	
26.25	93	82	91	94	98	41.75	98	96		98	
26.50	93	82	91	94	98	42.25	98	99		98	
26.75	93	83	91	94	98	42.50	98	99		100	
27.00	93	85	95	94	98	43.75	99	99			
28.75	94	85	98	94	98	48.00	100	100			
29.00	94	85	98	94	98	50.00					
29.75	94	87	98	94	98						
N -							313	62	48	69	151
$\bar{x}$ -							15.92	18.48	14.03	14.83	14.86
SD -							7.23	11.58	6.31	8.29	5.26

<sup>1</sup>The group designations are: Vocational Rehabilitation Counselor (VRC), Cashier (C), Marker (M), Salesclerks (S) and Professional School Counselors (PSC). The  $D^2$  values of less than 9.00, 9.00 to 20.00 and greater than 20.00 predict approximately 25% to be "satisfied," 50% to be "likely satisfied" and 25% to be "dissatisfied" respectively.

# Appendix D

**Table D-1**

**Varimax factor loading matrix for vocational rehabilitation clients  
(N = 1,621)**

MIQ Scale	Factors						h <sup>2</sup>
	I	II	III	IV	V	VI	
Ability Utilization	-.22	-.34	-.15	-.27	.58	-.04	.59
Achievement	-.21	-.27	.16	-.30	.60	-.14	.61
Activity	-.26	-.05	.63	-.24	.27	-.15	.61
Advancement	-.53	-.37	-.03	-.16	.39	-.04	.60
Authority	-.28	-.58	.13	-.14	.02	-.27	.52
Company Policies and Practices	-.37	-.14	.05	-.62	.16	-.02	.57
Compensation	-.62	-.18	.19	-.14	.05	-.15	.50
Co-workers	-.25	-.11	.30	-.39	.10	-.40	.48
Creativity	-.03	-.76	.13	-.16	.24	-.03	.69
Independence	-.26	-.28	.55	-.06	.06	-.06	.45
Moral Values	.00	-.06	.08	-.45	.15	-.11	.25
Recognition	-.44	-.35	.11	-.14	.38	-.21	.53
Responsibility	-.13	-.77	.23	-.13	.23	-.07	.75
Security	-.62	-.01	.30	-.17	.26	-.04	.57
Social Service	.07	-.19	.26	-.36	.28	-.32	.41
Social Status	-.35	-.26	.16	-.08	.17	-.42	.43
Supervision- Human Relations	-.45	-.21	.07	-.61	.05	.00	.63
Supervision-Technical	-.42	-.14	.15	-.59	.10	-.01	.58
Variety	-.14	-.40	.52	-.11	.03	-.18	.49
Working Conditions	-.57	-.08	.30	-.31	.11	-.14	.55
Contribution of factor	2.61	2.43	1.55	2.09	1.44	.69	10.79
Proportion of common variance	.24	.23	.15	.19	.13	.06	1.00
Proportion of total variance	.13	.12	.08	.11	.07	.03	.54

**Table D-2**  
**Varimax factor loading matrix for employed workers**  
**(N = 3,033)**

MIQ Scale	Factors						h <sup>2</sup>
	I	II	III	IV	V	VI	
Ability Utilization	-.11	<u>.64</u>	-.13	-. <u>37</u>	-.22	-.14	.64
Achievement	-.10	<u>.51</u>	-.14	-. <u>47</u>	-.31	-.13	.63
Activity	-.22	.16	-. <u>65</u>	-.16	-.19	-.05	.56
Advancement	-.23	<u>.50</u>	-.03	-.05	-. <u>52</u>	.07	.58
Authority	-.18	<u>.53</u>	-.22	.03	-.17	.38	.54
Company Policies and Practices	-. <u>60</u>	.14	-.11	-.27	-.27	.02	.54
Compensation	-.30	.11	-.20	-.02	-. <u>57</u>	.08	.47
Co-workers	-.18	.06	-.39	-. <u>44</u>	-.26	.18	.47
Creativity	-.13	<u>.80</u>	-.15	-.18	-.01	.05	.72
Independence	-.16	.19	-. <u>60</u>	-.02	-.15	.09	.45
Moral Values	-.23	.06	.00	-. <u>46</u>	-.03	.05	.27
Recognition	-.19	.38	-.20	-.11	-. <u>51</u>	.14	.51
Responsibility	-.11	<u>.80</u>	-.21	-.11	-.06	.15	.73
Security	-.31	-.04	-.37	-.11	-. <u>50</u>	.01	.50
Social Service	-.07	.30	-.26	-. <u>56</u>	.01	.01	.48
Social Status	-.10	.29	-.24	-.18	-. <u>36</u>	<u>.41</u>	.48
Supervision-Human Relations	-. <u>72</u>	.18	-.17	-.12	-.21	.06	.63
Supervision-Technical	-. <u>70</u>	.17	-.23	-.13	-.20	.06	.63
Variety	-.08	.33	-.60	-.15	-.12	.14	.52
Working Conditions	-.36	.04	-. <u>39</u>	-.17	-.50	-.00	.55
Contribution of factor	2.02	3.08	2.03	1.36	1.95	.48	10.91
Proportion of common variance	.19	.28	.19	.12	.18	.04	1.00
Proportion of total variance	.10	.15	.10	.07	.10	.02	.54

**Table D-3**  
**Varimax factor loading matrix for college students**  
**(N = 419)**

MIQ Scale	Factors						h <sup>2</sup>
	I	II	III	IV	V	VI	
Ability Utilization	-.45	.23	-.15	.18	.07	-.37	.45
Achievement	-.34	.24	-.20	.18	-.16	-.39	.42
Activity	-.40	.14	.05	.53	-.09	-.21	.52
Advancement	-.13	.25	-.58	.21	.28	.03	.54
Authority	-.41	.06	-.55	-.08	-.04	.11	.50
Company Policies							
and Practices	-.07	.66	-.02	.19	-.32	-.01	.58
Compensation	.01	.21	-.52	.31	.08	.02	.42
Co-workers	-.14	.20	-.15	.47	-.44	-.16	.52
Creativity	-.75	.11	-.12	-.04	-.04	-.14	.61
Independence	-.44	.03	-.07	.18	.00	-.04	.23
Moral Values	.13	.35	.02	.00	-.46	.08	.36
Recognition	-.19	.01	-.61	.08	.05	-.29	.50
Responsibility	-.78	.11	-.22	-.05	.00	.07	.67
Security	.05	.34	-.19	.57	-.03	.05	.48
Social Service	-.25	.16	.16	.09	-.43	-.13	.32
Social Status	-.11	-.05	-.74	.09	-.11	-.05	.59
Supervision-							
Human Relations	-.17	.72	-.12	.20	-.04	-.09	.61
Supervision-Technical	-.19	.67	-.10	.21	-.12	-.15	.57
Variety	-.46	-.03	-.10	.36	-.08	-.15	.38
Working Conditions	-.09	.24	-.21	.60	-.05	-.04	.47
Contribution of factor	2.46	2.04	2.15	1.71	.85	.56	9.76
Proportion of							
common variance	.25	.21	.22	.18	.09	.05	1.00
Proportion of							
total variance	.12	.10	.11	.09	.04	.03	.49

# Appendix E

Table E-1

Mean MIQ scale values for Rehabilitation Counselors,  
by demographic subgroups

MIQ Scale	N =	Sex		Age			Education		Tenure		
		Male 189	Female 47	21-34 75	35-44 41	Over 44 32	College graduate 72	Post college 64	1 year 50	2 years 42	Greater than 2 years 56
AU		1.71	1.73	1.72	1.64	1.77	1.70	1.72	1.74	1.57	1.78
Ach		1.81	1.76	1.85	1.72	1.73	1.88	1.72	1.84	1.84	1.71
Act		.15	.00	.11	.09	.35	.24	.13	.13	.13	.20
Adv		<u>1.38</u>	<u>1.03</u>	1.39	1.32	1.26	1.42	1.27	1.36	1.41	1.28
Au		<u>-.01</u>	<u>-.31</u>	-.03	-.19	.06	.01	-.05	-.20	-.01	.04
CPP		.98	.99	.97	1.03	1.18	<u>1.14</u>	<u>.91</u>	1.03	1.11	.97
Com		.86	.70	.99	.90	1.04	<u>1.09</u>	.82	.96	1.06	.93
Cow		.65	.49	.60	.58	.56	.65	.55	.53	.75	.51
Cre		1.32	1.19	1.23	1.25	1.27	1.17	1.36	1.21	1.29	1.24
Ind		-.10	-.35	-.29	.10	-.08	-.03	-.27	-.11	-.16	-.14
MV		1.23	.95	1.10	.98	1.17	1.08	1.13	.86	1.11	1.26
Rec		<u>1.02</u>	.77	1.01	.98	1.04	1.09	.95	.97	1.15	.94
Res		<u>1.28</u>	<u>1.15</u>	1.29	1.19	1.31	1.30	1.24	1.33	1.23	1.23
Sec		.71	.25	.59	.79	.91	.81	.60	.65	.71	.78
SSe		<u>1.55</u>	<u>1.26</u>	<u>1.36</u>	<u>1.52</u>	<u>1.78</u>	1.56	1.43	1.56	1.43	1.49
SSt		-.15	-.40	-.28	-.19	-.18	-.08	-.40	-.43	.07	-.29
SHR		.91	.78	.80	.98	<u>1.20</u>	<u>1.05</u>	<u>.85</u>	<u>.96</u>	<u>.85</u>	<u>.98</u>
ST		.65	.67	.58	.59	.86	-.70	-.60	.67	.65	.62
Var		.41	.32	.45	.39	.35	.42	.36	.30	.64	.34
WC		.77	.64	.74	.86	.83	.92	.69	.76	.94	.71
TCT		<u>65.84</u>	<u>43.17</u>	54.45	61.12	76.00	58.36	61.83	49.92	64.76	67.96

Note — Significant differences are underscored.

Table E-2

Mean MIQ scale values for Retail Workers I,  
by demographic subgroups

MIQ Scale	N =	Sex		Age				Education		
		Males 1,267	Females 482	Under 25 403	25-34 624	35-44 464	Over 44 374	Grade school 170	High school 1,561	Post high school 131
AU		1.54	1.52	1.46	1.52	1.58	1.60	1.36	1.54	1.76
Ach		1.52	1.62	1.45	1.51	1.61	1.65	1.40	1.56	1.64
Act		.63	.93	.64	.63	.73	.95	.82	.73	.42
Adv		1.66	1.42	1.54	1.64	1.66	1.52	1.36	1.61	1.81
Au		.27	-.31	.00	.16	.14	.13	.06	.11	.25
CPP		1.22	1.25	1.03	1.20	1.29	1.41	1.23	1.24	1.11
Com		1.36	1.42	1.32	1.38	1.39	1.41	1.36	1.39	1.31
Cow		.64	.85	.84	.65	.65	.70	.77	.72	.36
Cre		1.22	.87	1.03	1.15	1.15	1.15	1.05	1.11	1.36
Ind		.20	.30	.29	.17	.21	.31	.54	.23	-.05
MV		1.11	1.16	.94	1.06	1.25	1.38	1.09	1.14	1.28
Rec		1.26	1.24	1.23	1.27	1.25	1.28	1.22	1.27	1.16
Res		1.17	.85	1.00	1.10	1.14	1.05	.97	1.08	1.24
Sec		1.41	1.48	1.40	1.42	1.41	1.50	1.58	1.46	.90
SSe		1.00	1.04	.97	.90	1.07	1.16	.99	1.02	.88
SSt		.16	-.15	.23	.08	-.02	.10	.22	.09	-.13
SHR		1.33	1.21	1.17	1.30	1.34	1.43	1.36	1.31	1.22
ST		1.07	1.04	.97	1.06	1.10	1.18	1.13	1.08	.88
Var		.61	.62	.70	.59	.57	.63	.71	.62	.48
WC		1.18	1.38	1.25	1.25	1.20	1.24	1.34	1.27	.70
TCT		102.74	85.15	109.67	98.17	92.64	96.50	120.64	99.14	69.12

Note — Significant differences are underscored.

(continued on next page)

Table E-2 (continued)  
Mean MIQ scale values for Retail Workers I,  
by demographic subgroups

MIQ Scale	Tenure								
	Less than 1 year	1-2 years	3-5 years	6-10 years	11-15 years	16-20 years	21-25 years	26-30 years	Over 30 years
	<u>244</u>	<u>238</u>	<u>324</u>	<u>361</u>	<u>245</u>	<u>171</u>	<u>84</u>	<u>50</u>	<u>30</u>
AU	1.48	1.41	1.50	1.52	1.61	1.58	1.60	1.87	1.61
Ach	1.45	1.44	1.49	1.54	1.63	1.64	1.67	1.82	1.69
Act	.62	.64	.75	.65	.70	.85	.80	.94	.94
Adv	1.50	1.54	1.54	1.66	1.68	1.64	1.66	1.60	1.41
Au	.03	-.02	.03	.09	.18	.20	.28	.49	.24
CPP	1.06	1.02	1.22	1.25	1.28	1.35	1.47	1.51	1.48
Com	1.30	1.26	1.37	1.48	1.42	1.30	1.51	1.36	1.31
Cow	.74	.75	.76	.64	.64	.61	.70	.62	.74
Cre	1.00	.96	1.08	1.14	1.23	1.30	1.25	1.30	1.03
Ind	.32	.15	.31	.13	.27	.20	.29	.22	-.03
MV	.96	.99	1.06	1.12	1.24	1.22	1.29	1.51	1.39
Rec	1.20	1.18	1.22	1.26	1.34	1.29	1.29	1.39	1.27
Res	.98	.91	1.04	1.12	1.15	1.19	1.25	1.34	.95
Sec	1.50	1.38	1.42	1.46	1.44	1.32	1.44	1.52	1.42
SSe	1.01	.89	.98	.92	1.04	1.16	1.12	1.27	1.19
SSt	.31	.11	.03	-.01	.04	-.06	1.20	.06	.19
SHR	1.17	1.17	1.24	1.35	1.36	1.36	1.59	1.39	1.51
ST	.98	.14	1.02	1.08	1.15	1.11	1.30	1.07	1.26
Var	.70	.52	.73	.55	.55	.63	.62	.68	.54
WC	1.32	1.19	1.28	1.22	1.20	1.14	1.30	1.18	1.16
TCT	120.65	107.43	101.49	84.01	95.35	89.75	94.87	81.16	74.97

Note — Significant differences are underscored.

Table E-3

Mean MIQ scale values for Retail Workers II,  
by demographic subgroups

MIQ Scale	N =	Sex		Age				Education			Marital status		
		Male 131	Female 445	Under 25 186	25-34 101	35-44 154	Over 45 122	Not a high school graduate 95	High school grad 348	Post high school 132	Single 124	Married 412	Other 39
AU		1.57	1.54	1.56	1.59	1.53	1.55	1.35	1.57	1.62	1.56	1.55	1.90
Ach		1.66	1.81	1.73	1.74	1.83	1.71	1.71	1.80	1.76	1.68	1.81	1.73
Act		.53	.90	.69	.83	.83	1.01	.90	.87	.63	.62	.89	.77
Adv		1.87	1.48	1.63	1.70	1.51	1.50	1.29	1.61	1.67	1.64	1.53	1.80
Au		.41	-.06	.13	-.01	.01	.06	.04	.01	.15	.19	.01	-.04
CPP		1.12	1.31	1.10	1.28	1.41	1.39	1.24	1.31	1.18	1.04	1.33	1.36
Com		1.11	1.26	1.06	1.19	1.35	1.43	1.21	1.27	1.14	1.07	1.27	1.32
Cow		.63	.84	.87	.73	.80	.72	.81	.79	.77	.88	.78	.61
Cre		1.40	1.05	1.21	1.11	1.03	1.15	1.02	1.06	1.39	1.16	1.14	.96
Ind		-.02	.25	.19	-.01	.19	.36	.34	.18	.12	.12	.23	.10
MV		.55	.95	.79	.82	1.01	.80	.76	.89	.85	.70	.92	.74
Rec		1.36	1.23	1.31	1.27	1.20	1.26	1.15	1.27	1.30	1.29	1.26	1.13
Res		1.44	1.05	1.21	1.12	1.13	1.08	1.01	1.10	1.33	1.14	1.15	1.07
Sec		1.26	1.28	1.21	1.22	1.30	1.38	1.26	1.31	1.14	1.25	1.24	1.53
SSe		.86	1.14	1.03	1.04	1.19	1.08	1.14	1.13	.90	1.03	1.11	.93
SSt		.00	-.32	-.11	-.24	-.35	-.31	-.27	-.25	-.24	-.12	-.28	-.31
SHR		1.15	1.14	.96	1.22	1.25	1.26	1.22	1.17	1.06	.95	1.20	1.20
ST		.99	1.06	.86	1.04	1.15	1.20	1.12	1.08	.93	.86	1.10	1.13
Var		.45	.53	.59	.46	.50	.49	.58	.52	.46	.62	.50	.30
WC		1.02	1.40	1.11	1.29	1.46	1.49	1.40	1.36	1.14	1.10	1.38	1.37
TCT		79.19	82.14	79.83	77.68	80.65	82.85	100.66	81.70	67.32	79.83	82.87	72.82

Note — Significant mean differences are underscored.



Table E-4

Mean MIQ scale values for Vocational Rehabilitation Clients,  
by demographic subgroups

MIQ Scale	N =	Sex		Education					Marital status			
		Male 1,148	Female 419	Less than 8th grade 70	8th grade 180	Some high school 503	High school grad 668	Post high school 84	Single 851	Married 523	Divorced 123	Other 104
AU		1.63	1.63	1.52	1.75	1.62	1.63	1.52	1.50	1.74	1.85	1.84
Ach		1.54	1.63	1.44	1.72	1.57	1.54	1.54	1.42	1.70	1.82	1.77
Act		.62	.68	1.16	.96	.69	.53	.26	.52	.72	.79	.83
Adv		1.50	1.20	1.29	1.49	1.44	1.42	1.28	1.27	1.59	1.58	1.51
Au		-.11	-.49	-.15	-.11	-.20	-.23	-.30	-.31	-.07	-.08	-.23
CPP		.87	.96	.88	1.04	.92	.83	.85	.77	1.00	1.06	1.05
Com		.87	.68	1.07	1.06	.88	.71	.68	.70	.95	.94	.92
Cow		.66	.77	.81	.72	.76	.64	.64	.74	.62	.61	.72
Cre		.94	.65	.75	.81	.87	.86	.97	.76	.98	1.02	.98
Ind		.39	.29	.93	.73	.45	.24	.01	.26	.46	.49	.61
MV		.74	.77	.94	.89	.75	.68	.78	.67	.88	.77	.70
Rec		1.02	.84	.99	1.15	.98	.96	.84	.85	1.13	1.05	1.13
Res		1.00	.69	.73	.95	.96	.93	.83	.78	1.07	1.10	.99
Sec		1.41	1.26	1.61	1.74	1.39	1.29	1.09	1.22	1.54	1.43	1.51
SSe		1.04	1.34	1.11	1.14	1.17	1.11	1.00	1.08	1.15	1.23	1.18
SSSt		.14	-.06	.29	.35	.27	-.01	-.39	.12	.02	.19	.15
SHR		.78	.56	.84	.90	.76	.65	.59	.59	.88	.87	.73
ST		.90	.80	1.08	.99	.93	.80	.70	.78	.98	.93	.90
Var		.51	.46	.67	.59	.55	.46	.31	.47	.53	.51	.59
WC		1.03	1.08	1.21	1.18	1.10	.99	.88	1.00	1.09	1.05	1.14
TCT		92.84	87.82	122.59	99.91	102.10	85.43	73.68	103.00	81.72	81.17	75.42

Note — Significant differences are underscored.

(continued on next page)

**Table E-4 (continued)**  
**Mean MIQ scale values for Vocational Rehabilitation Clients,**  
**by demographic subgroups**

		Age													
MIQ	N =	16-17	18	19	20	21	22	23	24-25	26-30	31-35	36-40	41-45	46-50	Over 51
Scale		79	144	151	110	88	64	61	90	142	120	106	133	111	168
AU		1.40	1.52	1.49	1.49	1.54	1.65	1.48	1.64	1.64	1.69	1.76	1.86	1.80	1.73
Ach		1.45	1.31	1.41	1.41	1.50	1.46	1.55	1.61	1.61	1.71	1.79	1.75	1.70	1.63
Act		.48	.39	.58	.51	.51	.23	.49	.64	.57	.78	.78	.74	.76	1.00
Adv		1.21	1.21	1.28	1.27	1.38	1.52	1.31	1.52	1.50	1.56	1.59	1.64	1.58	1.33
Au		-.27	-.30	-.34	-.47	-.25	-.40	-.22	-.19	-.17	-.08	-.22	-.13	-.03	-.05
CPP		.74	.69	.76	.77	.76	.79	.77	.76	.86	1.01	1.09	1.09	1.65	1.10
Com		.62	.65	.66	.72	.67	.61	.68	.84	.84	.96	.95	.97	.97	1.09
Cow		.72	.76	.77	.66	.72	.72	.64	.63	.66	.69	.65	.66	.61	.72
Cre		.82	.73	.75	.79	.71	1.00	.83	.98	.94	1.02	.85	.94	.88	.87
Ind		.24	.03	.37	.20	.05	-.01	.19	.33	.41	.55	.34	.52	.56	.78
MV		.82	.66	.66	.50	.53	.56	.95	.60	.66	.90	.87	.84	.97	.92
Rec		.85	.73	.83	.91	.96	.98	.91	.99	.99	1.03	1.01	1.03	1.14	1.15
Res		.78	.74	.75	.83	.84	.96	.79	.97	1.08	1.12	.99	1.06	.93	.93
Sec		1.09	1.11	1.28	1.23	1.27	1.18	1.28	1.38	1.37	1.41	1.65	1.54	1.52	1.60
SSe		1.25	1.12	1.14	1.02	1.00	.96	1.04	1.06	1.03	1.16	1.25	1.13	1.18	1.19
SSt		.20	.20	.07	.10	.18	-.06	.35	.02	.04	.17	-.07	-.02	.07	.04
SHR		.44	.57	.62	.57	.60	.49	.59	.65	.70	.86	.94	.90	.88	.92
ST		.63	.65	.81	.88	.74	.88	.68	.85	.82	.98	1.03	.97	1.06	1.02
Var		.40	.56	.43	.47	.55	.40	.47	.50	.42	.67	.47	.47	.54	.57
WC		1.01	.91	1.08	.89	1.05	.87	.99	.97	1.06	1.12	1.16	1.13	1.12	1.13
TCT		115.94	103.16	96.15	99.24	87.15	78.66	105.20	88.82	82.95	89.90	75.70	77.84	87.91	95.86

Note — Significant differences are underscored.