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*Application of the
Theory of Work
Adjustment to
Rehabilitation and
Counseling*

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with the assistance of
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Work Adjustment Project
Industrial Relations Center
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Preface

This monograph is the final report on the project entitled "The Minnesota Studies in Vocational Rehabilitation – Work Adjustment Project," which has been supported through Research Grant 12-P-55192/5 from the Social and Rehabilitation Service, U.S. Department of Health, Education and Welfare. The report covers the grant period from July 1, 1964 to June 30, 1972.

The Work Adjustment Project, as the project was better known, was a continuing series of research studies on the general problem of adjustment to work, with a specific focus on work adjustment problems relevant to vocational rehabilitation services. Results of these studies have been reported principally in the monograph series, the *Minnesota Studies in Vocational Rehabilitation*. Thirty monographs, including this one, have been published in this series. In addition, 21 articles on Work Adjustment Project research have been published in a variety of professional journals; 47 mimeographed reports of separate studies have been distributed in a Research Report series and 40 Ph.D dissertations have been written in connection with Work Adjustment Project research. (See Appendices for a listing of these publications.)

The major accomplishments of the project, however, have been the articulation of a conceptual framework for research and practice – the Theory of Work Adjustment – and the development of instruments with which to measure the concepts in this theory. Instruments developed for the Theory of Work Adjustment include the Minnesota Importance Questionnaire, the Minnesota Satisfaction Questionnaire, the Minnesota Satisfactoriness Scales, the Occupational Reinforcer Patterns and the Minnesota Job Description Questionnaire. The application of this theory and these instruments to vocational rehabilitation and vocational counseling practice is the subject of the present monograph.

In the few years since they were developed, these instruments have enjoyed wide usage by rehabilitation and counseling practitioners. To provide a continuing service to present and future users of these instruments, permission was obtained from the Vocational Rehabilitation Administration (letter of June 1, 1968) to publish and distribute the instruments. Vocational Psychology Research was established to serve as a distribution and scoring service agency. Individuals interested in using any of the instruments should write: Vocational Psychology Research, Elliott Hall, Department of Psychology, University of Minnesota, Minneapolis, Minnesota 55455.

For fifteen years the authors have been privileged to be recipients of continuing and generous support from the U.S. Department of Health, Education and Welfare in their research endeavors. At this time the authors wish to express publicly their deep appreciation of this support. The Work Adjustment Project officially terminated on June 30, 1972, but the research will continue, thanks

in large part to the momentum generated by previous research. Our deep gratitude and appreciation, too, to all the "alumni" of the Work Adjustment Project, both research and civil service staffs, and especially to our esteemed colleagues, Professors George W. England and David J. Weiss.

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The Work Adjustment Project

The Work Adjustment Project was a programmatic series of studies on the problem of adjustment to work, with a focus on two basic objectives: 1) the prediction of work adjustment, and 2) the understanding of the process of adjustment to work. Attainment of these objectives was facilitated by the construction of a theory, the *Theory of Work Adjustment*, (Dawis, England and Lofquist, 1964; Dawis, Lofquist and Weiss, 1968; Lofquist and Dawis, 1969) as a framework for research.

The Theory of Work Adjustment focuses on the interaction between *work personality* and *work environment* as a way of conceptualizing the process by which an individual adjusts to work. The Theory states that: in this interaction vocational *abilities* and vocational *needs* are the significant aspects of work personality; *ability requirements* and *reinforcer* systems are the significant aspects of the work environment; and *satisfactoriness*, *satisfaction* and *tenure* are the significant outcomes of work personality-work environment interaction.

To implement the Theory of Work Adjustment, instruments were developed to measure the theory's concepts where these were not available (Weiss, Dawis, Lofquist, and England, 1966). Attention was focused first on the measurement of the outcomes of work adjustment, satisfaction and satisfactoriness (Carlson, Dawis, England and Lofquist, 1962, 1963). The Minnesota Satisfaction Questionnaire (MSQ; Weiss, Dawis, England and Lofquist, 1967) and the Minnesota Satisfactoriness Scales (MSS; Gibson, Weiss, Dawis and Lofquist, 1970) were the instruments resulting from this effort. The measurement of vocational abilities and ability requirements received less attention inasmuch as the extensively developed General Aptitude Test Battery (GATB) and Occupational Aptitude Patterns (OAPs) of the U.S. Training and Employment Service were available for research use. In contrast, no appropriate instruments were found with which to measure vocational needs and reinforcer systems. A major effort was therefore devoted to constructing these needed measures. The first results of this activity were published in 1964-65 (Weiss, Dawis, England and Lofquist, 1964a, 1964b, 1965). The measure of vocational needs, the Minnesota Importance Questionnaire (MIQ), was available in a rating scale format as early as 1964 (Weiss, et al., 1964a). A more sophisticated, pair comparison, form of the MIQ was completed in 1967 (Gay, Weiss, Hendel, Dawis, and Lofquist, 1971).

The first Occupational Reinforcer Patterns (ORPs) were published in 1968 (Borgen, Weiss, Tinsley, Dawis and Lofquist, 1968a, 1968b). A second set of ORPs was published recently (Rosen, Weiss, Hendel, Dawis and Lofquist, 1972).

With the development of these instruments, the Theory of Work Adjustment was made operational and available for application. Research on applications of the Theory, in part or whole, progressed steadily in a variety of settings. The information provided by the various instruments found its most immediate use in the prediction of work adjustment. Studies were conducted in several industrial organizations on the prediction and facilitation of employee satisfaction and employee satisfactoriness. The Work Adjustment Project collaborated with Project Miniscore in studies focusing on selection and differential placement of vocational-technical school students. In cooperation with the University Civil Service Department, a pilot clinic was organized to provide vocational assessment and vocational counseling for disadvantaged University employees.

The most extensive use of Theory of Work Adjustment instruments, however, has been in an experimental program with the Minnesota Division of Vocational Rehabilitation (DVR) to provide extensive vocational assessment services for DVR clients. The DVR Vocational Assessment Program, as the program is called, consists of administering, scoring, and reporting results for the following measures; the GATB, the MIQ, the Minnesota Vocational Interest Inventory (MVII), the Minnesota Multiphasic Personality Inventory (MMPI), the Strong Vocational Interest Blank (SVIB) and the Gates Reading Survey (GRS). Beginning with an exploratory pilot program for a few hundred clients of the Twin City local offices in 1966, the program has grown to serving over 2,000 clients from 45 local offices in 1971.

Attention was also given to the adaptation of the Theory of Work Adjustment instruments for use with special disability groups. A 3-year (1967-70) "satellite" project was conducted on the problem of adapting the GATB and MIQ for use with mentally retarded individuals (Lofquist, Dawis and Weiss, 1970). Success was rather limited in the attempt to modify the GATB by simplifying instructions, testing format and practice problems. More success was attained in developing a 17-scale simplified form of the MIQ that yielded scores which were psychometrically equivalent to those of the regular pair comparison MIQ form. The normative data obtained during this study demonstrated that mentally retarded adults were

almost as variable as "normal" adults in all abilities except verbal ability and general mental ability (which is based largely on verbal material). Near-normal variability was also obtained in measured needs. (The reader is referred to the project's final report, Lofquist, Dawis and Weiss, 1970, for more detail on a variety of findings.)

Other instrument modifications for special disability groups included audio tapes for the MIQ for use with blind individuals and card form of the MIQ, for use in a card-sorting administration format, for individuals who may not be sufficiently motivated to take the regular paper and pencil form.

The study of the process of work adjustment was the other major area of activity. Several follow-up surveys were conducted to study the changes in work adjustment, as well as changes in response to the instruments (test-retest reliability). Thus, for example, in one study it was found that changes in specific scale values on the MIQ may at times be considerable, but that the scale *patterns* (rank order of scale values) tended to be quite stable. Also, changes in satisfaction were found to be considerable and associated with certain correlates.

An important project during the past three years was the development of a measure of the "active vs reactive" dimension of work adjustment style. The "active mode" of work adjustment is that of an individual who "acts on" (manipulates or operates on) the environment to change it to become more correspondent (suited) to him. The "reactive mode" of work adjustment is exhibited when the individual prefers to change himself to correspond to (conform to) the environment. In other words, he "reacts to" rather than "acts on" the environment. The instrument being developed calls for the respondent to choose from alternative ways of dealing with various work situations, the alternatives being preferred differentially by "actives" and "reactives." The instrument is now ready for validity studies.

A major follow-up study was conducted in 1968, in which over 6,000 former DVR clients were contacted by mail or telephone. Information was obtained on employment status, types of jobs held, earnings, hours, job satisfaction and employee satisfactoriness. This study provided both qualitative and quantitative data on the "success" of vocational rehabilitation with these clients through the use of Theory of Work Adjustment instruments, specifically the short-form MSQ and the MSS.

The preceding narrative describes in condensed fashion the major activities in the Work Adjustment Project during the project period

1964-1972. The project period began with the publication of the original statement of the Theory of Work Adjustment (Dawis, et al. 1964). Many of the studies of the Work Adjustment Project during this period were therefore directed toward making the theory operational. Details of these several studies are available in the *Minnesota Studies in Vocational Rehabilitation* series and in other publications of the Work Adjustment Project listed in the Appendices.

The success of the Work Adjustment Project in realizing the objectives of predicting and understanding adjustment to work rests to a large extent on its success in developing the Theory of Work Adjustment and making it operational. A good measure of the operationalization of the theory is the extent to which the theory and its instruments could be applied to the actual practice of rehabilitation and counseling. To illustrate these applications, and because of their wide applicability to public and private rehabilitation and counseling programs, three Work Adjustment Project activities are reported below in considerable detail. These activities are: (1) the DVR Vocational Assessment Program; (2) the DVR 5-year Follow-up Survey; and (3) the pilot Vocational Assessment Clinic.

Before these activities are described, however, a brief summary of the Theory of Work Adjustment is given to set the stage, so to speak, for the applications to follow, especially for those readers unfamiliar with the theory who may not have access to the *Minnesota Studies in Vocational Rehabilitation* monograph series.

The Theory of Work Adjustment

Work, according to the theory, is an encounter between an individual, with his unique work personality, and a work environment. In this encounter, there is mutual interaction (action and reaction) between individual and environment. It is the basic principle of the Theory of Work Adjustment that *each individual seeks to achieve and maintain correspondence with his environment*, in the case of work, with the work environment. *Correspondence* can be described in terms of the individual's fulfilling the requirements of the work environment and the work environment fulfilling the requirements of the individual. In other words, correspondence is inferred when the individual is both satisfactory and satisfied. *Satisfactoriness* and *satisfaction*, then, indicate the correspondence between individual and work environment. Furthermore, such correspondence is manifested as *tenure* in the job.

The continuous and dynamic process by which the individual seeks to achieve and maintain correspondence with his work environment is called *work adjustment*. To predict the outcome of work adjustment, the significant aspect of the individual is his *work personality*, and the significant aspects of his work personality are his vocational abilities and vocational needs. *Abilities* are basic dimensions of response capability generally utilized by the individual. *Needs* are basic preferences for responding in certain stimulus conditions which have been experienced by the individual to be reinforcing.

Predicting work adjustment also requires information about the work environment. According to the theory, the *work environment* must be described in work-personality terms, that is, in terms of both *ability requirements* and *reinforcer systems*. If individuals were described in terms of abilities and needs, and if work environments were described in terms of ability requirements and reinforcer systems, it is possible to measure the *degree* of correspondence between any individual and any work environment. The more correspondent an individual is to the work environment, the more confident we are of a favorable work adjustment if the individual were to work in that environment. Furthermore, the more correspondent an individual's abilities are to the ability requirements of the job, the more confident we are of his being able to perform the job satisfactorily; and the more correspondent the job's reinforcer system is to the individual's needs, the more confident we are of the individual's being

satisfied with his job. In other words, we predict *satisfactoriness* from the *ability-ability requirement correspondence* of individual and work environment, and *satisfaction* from the *need-reinforcer system correspondence* of individual and work environment. We predict *tenure* from the combination of the individual's satisfactoriness and satisfaction, and therefore in principle we can predict tenure from ability-ability requirement and need-reinforcer system correspondences.

Thus, to utilize the Theory of Work Adjustment in the prediction of work adjustment, six measures are necessary: a measure of abilities, of needs, of ability requirements, of reinforcer systems, of satisfactoriness, and of satisfaction. With these measures, it is possible to determine the limits of satisfactoriness and satisfaction of groups of individuals with substantial tenure in specific work environments. In turn, the work personalities (levels of abilities and needs) for individuals who fall within these limits of satisfactoriness and satisfaction will define the *correspondent* work personalities. Finally, the patterns of correspondent work personalities can be used to define the patterns of ability requirements and reinforcer systems for specific work environments.

At present, application of the Theory of Work Adjustment can be made with use of the following instruments: the GATB to measure vocational abilities; the MIQ to measure vocational needs; the (USTES) OAPs to measure ability requirements; the ORPs to measure reinforcer systems; the MSS to measure satisfactoriness, and the MSQ to measure satisfaction. Such application, with the use of these instruments, is described in the following sections.

The DVR Vocational Assessment Program

The Theory of Work Adjustment was published in 1964, and by 1966 the Work Adjustment Project had developed the necessary instruments with which to apply the theory (Weiss, et al., 1966). One of the first experimental applications of the theory was undertaken with the cooperation of the Minnesota Division of Vocational Rehabilitation. A pilot vocational assessment program was conducted for the Twin City local offices. On a voluntary basis, Twin City DVR counselors referred a small number of clients to the Work Adjustment Project for vocational assessment. Initially, only the GATB and the MIQ were administered to the clients. At the counselors' request, the MMPI was added to the battery. The SVIB and MVII were also added to provide further vocational information that would be useful in vocational planning. The GATB, MIQ and MMPI were administered to all referred clients, the SVIB only to those with a high school education (12 years) or more, and the MVII only to males.

One of the features of the pilot program that was especially appealing to the DVR counselors was the relatively short time it took to report the assessment results back to them. Within two weeks after testing, the counselors received test-score information in standardized-score and profile form. The GATB and MIQ were scored by computer, using computer programs developed by the Work Adjustment Project. The MMPI, SVIB, and MVII were scored by a commercial test-scoring-service firm.

Initially, no attempt was made to interpret the results of the assessment. The GATB scores were reported as standardized scores and percentiles. The MIQ scores were reported as adjusted scale values. The MMPI, SVIB and MVII scores were reported on their familiar profile report forms (which included summary interpretation in terms of similarity to criterion groups — clinical groups in the case of the MMPI, occupational groups in the case of the SVIB and MVII). Interpretation of the GATB required a counselor to refer to the manual to look up Occupational Aptitude Patterns (OAPs) for which the client qualified. Likewise, interpretation of the MIQ required reference to the manual for appropriate Occupational Reinforcer Patterns (ORPs). While the counselors reacted favorably to the rapid reporting of assessment results, they expressed frustration at the excessive amount of time needed to look up OAPs and ORPs.

The next step, therefore, was the development of a test interpretation printout for the GATB and the MIQ. A computer program was

written which listed all the OAPs and all the occupations in the Worker Trait Requirements (WTR) list for which the client qualified by virtue of his GATB test scores. (Two years later, the WTR listing was dropped as obsolete.) In effect, this list of occupations for which the client qualified was a list of occupations for which the client was correspondent (in terms of ability-ability requirement correspondence) and therefore, according to the Theory of Work Adjustment, occupations for which the client had the potential to become a satisfactory worker. A second computer program was developed which listed for each client, all the ORPs (81 were available at the time) and an associated index of profile similarity (D^2) for each ORP. The D^2 index is easily interpretable in terms of need-reinforcer correspondence, hence the listing provided the counselor with some idea of the client's potential for satisfaction in each of the listed occupations and occupational clusters.

These computer programs underwent refinement since their original development. The printouts currently being used for the GATB and MIQ are shown in Figures 1 and 2 respectively.

Figure 1 contains a sample GATB printout. The printout was designed to conform to standard usage prescribed by the USTES. The aptitudes are listed on the left, followed by a listing of obtained standard scores (the GATB standard score scale has a mean of 100 and a standard deviation of 20). The next column lists the obtained standard score plus one standard error (an error of measurement factor which differs for different aptitudes). This listing represents the probable highest scores the client would obtain in repeated testings. To the right of these listings, a profile of the obtained scores is plotted, with an X representing the obtained standard score, and dashes on both sides of the X representing the error factor. As the illustration shows, some scores are more precise (have smaller errors) than others.

Below the listings and plot, three sets of OAP numbers are listed. The first set is a list of OAPs for which the probability is "good" that the client has the potential to become a satisfactory worker. The second set is a list of OAPs for which the probability of satisfactoriness is less than that for the first set. The third and final set lists OAPs for which the probability of satisfactoriness is least, that is, low. These listings of OAP numbers actually identify groups of occupations, and the printout qualifies the listings by stating that the client "may or may not qualify" for specific occupations included in the group.

REPORT ON THE GENERAL APTITUDE TEST BATTERY (GATB), FORM R-1002-S

	OBTAINED STANDARD SCORE	OBTAINED SCORE ± 1 S.E.M.	5	6	7	8	9	1	1	1	1	1
			4	0	0	0	0	0	0	0	0	0
G--GENERAL LEARNING ABILITY.....	121	127	.	.	.	.	.	.	.	.	.	.
V--VERBAL ABILITY	115	121	.	.	.	.	.	.	.	.	.	.
N--NUMERICAL ABILITY	105	111	.	.	.	.	.	.	.	.	.	.
S--SPATIAL ABILITY	127	135	.	.	.	.	.	.	.	.	.	.
P--FORM PERCEPTION	122	131	.	.	.	.	.	.	.	.	.	.
Q--CLERICAL PERCEPTION	153	162	.	.	.	.	.	.	.	.	.	.
K--MOTOR COORDINATION	101	108	.	.	.	.	.	.	.	.	.	.
F--FINGER DEXTERITY	108	120	.	.	.	.	.	.	.	.	.	.
M--MANUAL DEXTERITY	91	102	.	.	.	.	.	.	.	.	.	.
			-2	-1	0	0	0	0	0	0	0	0
			SD	SD								

THE GATB SCORES OF THIS INDIVIDUAL EQUAL OR EXCEED THOSE OF WORKERS JUDGED TO BE SATISFACTORY ON THE FOLLOWING OAPS (GROUPS OF OCCUPATIONS). HOWEVER, THE INDIVIDUAL MAY OR MAY NOT QUALIFY FOR SPECIFIC OCCUPATIONS INCLUDED IN THE OAP SINCE THE GATB QUALIFYING NORMS FOR A SPECIFIC OCCUPATION MAY BE DIFFERENT THAN THE OVERALL OAP NORM. IF HE IS QUALIFIED ON THE BASIS OF FACTORS OTHER THAN APTITUDES, THERE IS A GOOD PROBABILITY THAT HE WILL DO WELL ON THESE JOBS

2 3 5 6 7 8 9 10 11 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
29 30 31 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 51 52 54 55 56
57 58 59 60 61 62

THE GATB SCORES ARE CLOSE TO THOSE OF WORKERS JUDGED TO BE SATISFACTORY ON THE FOLLOWING OAPS (GROUPS OF OCCUPATIONS). AS FOR THE ABOVE OAPS, THE INDIVIDUAL MAY OR MAY NOT QUALIFY FOR SPECIFIC OCCUPATIONS INCLUDED IN THE OAP. THE CHANCES OF HIS DOING WELL IN THE FOLLOWING GROUPS OF OCCUPATIONS ARE SOMEWHAT LOWER THAN FOR THE ABOVE GROUP.

4 12 32 50 53

THE PROBABILITY OF THE INDIVIDUAL BEING SATISFACTORY IN THE FOLLOWING GROUPS OF OCCUPATIONS IS LOW AND HE USUALLY SHOULD BE CONSIDERED FOR OTHER JOBS WHICH UTILIZE HIS STRONGER APTITUDES. HOWEVER, THE INDIVIDUAL MAY QUALIFY FOR SPECIFIC OCCUPATIONS IN THE FOLLOWING OAPS EVEN THOUGH HE IS NOT QUALIFIED FOR THE OVERALL OAP. CHECK THE APTITUDE SCORE NORMS FOR SPECIFIC OCCUPATIONS WHICH ARE SUGGESTED ON THE BASIS OF OTHER RELEVANT FACTORS.

As the reader may note, the GATB printout cannot be interpreted without access to the GATB manual (especially Section II; Norms — Occupational Aptitude Pattern Structure) which lists the specific occupations constituting each OAP and their corresponding qualifying scores. The computer printout still requires the counselor to search Section II in the GATB manual for specific occupations for which the client qualifies. Search time, however, is greatly minimized by the listings. With practice, counselors can quickly get an idea from the printout, of the kinds of jobs for which the client has the potential to become a satisfactory worker. The counselor can then find out whether the client already has the appropriate skills or whether the client needs job training. With his knowledge of physical disability, the counselor can also ascertain whether these specific occupations (for which the client qualifies) are appropriate for the client.

Figure 2 contains a sample MIQ printout. The printout consists of two parts. In the first part, the MIQ adjusted scale values are listed for each scale and plotted in a graph; scale values are indicated by an X. The graph shows an error band for each score (the dashes on either side of the X). The second part of the printout lists correspondence indices for 148 occupations. Correspondence between a client's MIQ profile and an ORP is measured by the D-squared index. Prediction of satisfaction has three grades: "satisfied," "likely satisfied" and "not likely satisfied." Occupations are listed on the printout according to the occupational families (clusters) to which they belong. The twelve occupational families have been named according to the reinforcers which characterize each group of occupations. Interpretation of the MIQ is, of course, facilitated by reference to the MIQ manual (Gay, et al., 1971).

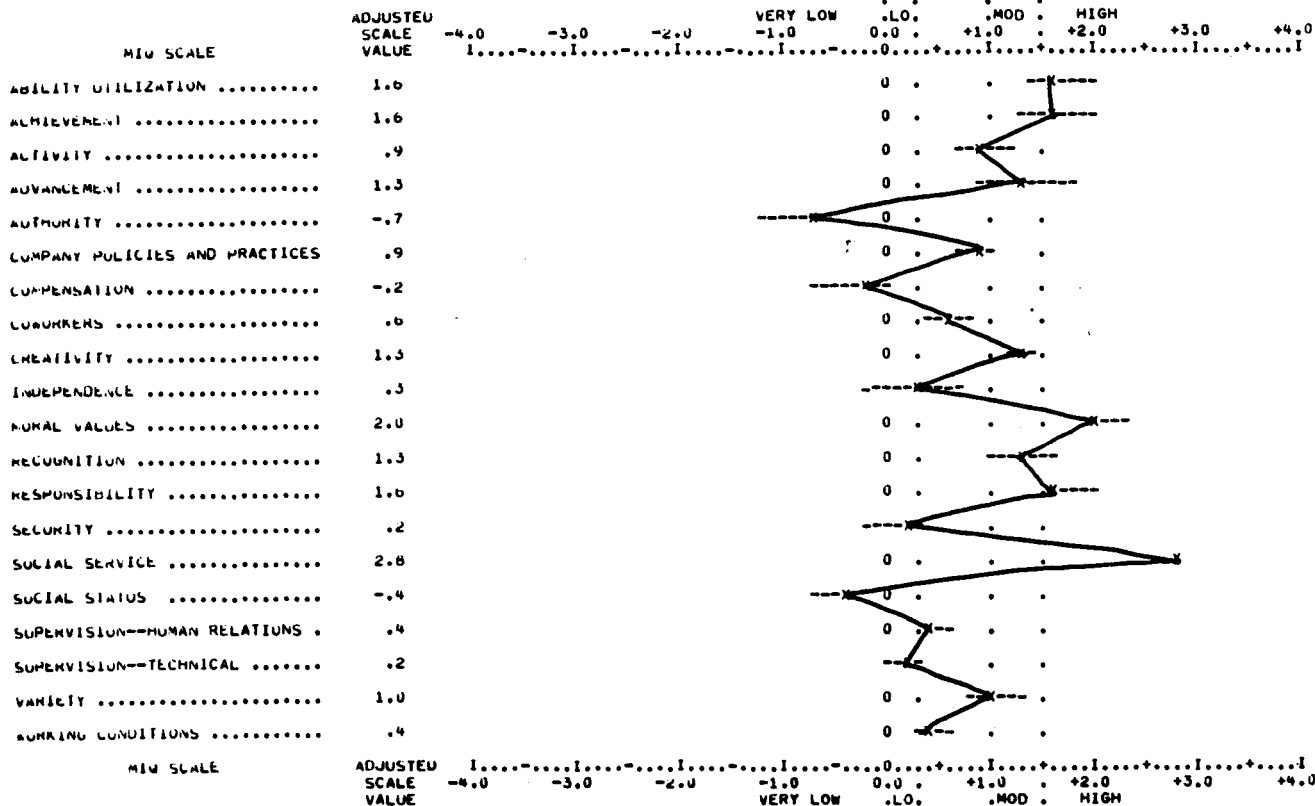
Two other aspects of the DVR Vocational Assessment Program are worth noting. First, there was mutual recognition on the part of the DVR and the Work Adjustment Project of the need for some form of orientation, update training, and ongoing evaluation of the program. This was provided for, with a research utilization specialist being assigned specifically to this task. A number of methods for facilitating maximal utilization of the assessment information by DVR counselors was in the process of development during the past project year. Evaluation surveys have been designed and implemented. Still to be conducted is a rigorous follow-up evaluation to determine if use of assessment information has any significant impact on the rehabilitation process and its outcomes.

Secondly, the DVR Vocational Assessment Program has provided

DATE-- 01/14/74

REPORT ON THE MINNESOTA IMPORTANCE QUESTIONNAIRE
(MIQ)
1967 REVISION

NAME-- SAMPLE REPORT

CIRCULAR TRIAD SCORE= 63
INVALID RESPONSE RANGE
BEGINS AT 255.
MIQ IS VALID.

	VOL.	PAGE	SATISFIED	LIKELY SATISFIED	NOT LIKELY SATISFIED
CLUSTER III -- SECURITY-WORKING CONDITIONS					
ACCOUNTING CLERK, MANUFACTURING	I	22		D	
ASSEMBLER(ELECTRICAL EQUIPMENT)	I	26			D
ASSEMBLER, PRODUCTION	II	30			D
ASSEMBLER, SMALL PARTS	I	28		D	
AUTOMOBILE SEAT COVER ETC. INSTALLER	II	32			D
BAKER	I	36		D	
BATTERY ASSEMBLER	II	36			D
BOOKBINDER	II	38		D	
BUTTLER, BREWERY	II	42			D
CASHIER-CHECKER	I	48		D	
KEY-PUNCH OPERATOR	II	80		D	
MARKER	I	98		D	
MEAT CUTTER	I	100			D
PUNCH-PRESS OPERATOR	I	134		D	
SEWING-MACHINE OPERATOR, AUTOMATIC	I	152			D
SOLDERER (PRODUCTION LINE)	II	132			D
TRUCK DRIVER	I	170			D
CLUSTER IV -- SECURITY-WORKING CONDITIONS-ACHIEVEMENT					
ACCOUNTING CLERK, CIVIL SERVICE	I	20		D	
BOOKKEEPER I	II	40			D
CABINETMAKER	II	46		D	
COOK(HOTEL-RESTAURANT)	I	58		D	
DIGITAL-COMPUTER OPERATOR	II	58		D	
DRAFTSMAN, ARCHITECTURAL	I	66		D	
ELECTRONICS MECHANIC	I	72		D	
LINEMAN (TELEPHONE)	II	84		D	
LITHOGRAPHIC-PRESS FEEDER	II	88		D	
LUMBER-YARD MAN	II	92		D	
MACHINIST	I	94		D	
PERSONNEL CLERK	II	104		D	
PRODUCTION HELPER (FOOD)	I	130		D	
SALESPERSON, GENERAL (DEPARTMENT STORE)	I	148		D	
SALESPERSON, SHOE	I	150		D	
SCREEN-MACHINE OPERATOR, PRODUCTION	I	152		D	
CLUSTER V -- SECURITY-SOCIAL SERVICE					
BARTENDER	I	38		D	
BUS DRIVER	I	42		D	
HAIR (HOTEL)	II	94		D	
MAIL CARRIER	II	96			D
NURSE AID	I	104		D	
ORDERLY	I	114		D	
POST-OFFICE CLERK	II	110			D
SALESPERSON, LIQUOR	II	122		D	
SERVICE REPRESENTATIVE, TELEPHONE	II	128		D	
TELEPHONE OPERATOR	II	144		D	
Teller (BANKING)	I	168		D	
USHER (THEATER)	II	150		D	
WAITER-WAITRESS	I	174		D	

---CONTINUED ON NEXT PAGE---

SAMPLE REPORT -- PAGE 4

	VOL.	PAGE	SATISFIED	LIKELY SATISFIED	NOT LIKELY SATISFIED
CLUSTER VI -- SECURITY-ACHIEVEMENT					
AIRPLANE PILOT, COMMERCIAL (CO-PILOT)	II	26			D
FIRE FIGHTER	I	84		D	
CLUSTER VII -- ACHIEVEMENT					
BRICKLAYER	II	44		D	
CEMENT MASON	II	48		D	
HEAVY EQUIPMENT OPERATOR(CONSTRUCTION)	I	86		D	
LANDSCAPE GARDENER	I	90		D	
LATHER	II	82		D	
PLASTERER	II	108		D	
ROOFER	II	114		D	
CLUSTER VIII -- ACHIEVEMENT-COMPENSATION					
AIR-CONDITIONING MECHANIC	II	20		D	
CARPENTER	I	44		D	
ELECTRICIAN	I	70		D	
ELEVATOR REPAIRMAN	II	62		D	
FURNACE INSTALLER-AND-REPAIRMAN	II	66		D	
GLAZIER (GLASS INSTALLER)	II	68		D	
MAINTENANCE MAN, FACTORY OR MILL	I	96		D	
PAINTER/PAPERHANGER	I	116		D	
PATTERNMAKER, METAL	II	102		D	
PHOTOVOLTAIC(STRIPPER)	I	120		D	
PIPEFITTER	I	124		D	
PLUMBER	I	126		D	
REPOSSESSOR	II	112		D	
SALESMAN, AUTOMOBILE	I	140		D	
SHEET METAL WORKER	I	156		D	
TILE SETTER (CERAMIC)	II	146		D	
TOOL-AND-DIE MAKER	II	148		D	
WELDER, COMBINATION	I	176		D	
CLUSTER IX -- ACHIEVEMENT-SECURITY					
AUTOMOBILE-BODY REPAIRMAN	I	30		D	
AUTOMOBILE MECHANIC	I	32		D	
BARBER	II	34		D	
BEAUTY OPERATOR	I	40	D		
CLAIM ADJUSTER	I	50		D	
COUNSELLOR (PRIVATE EMPLOYMENT AGENCY)	II	54	D		
ELECTRICAL TECHNICIAN	I	68		D	
ENGINEER, STATIONARY	I	80		D	
LITHOGRAPHIC PRESS PLATE-MAKER	II	90		D	
OFFICE-MACHINE SERVICEMAN	I	112		D	
SALESMAN-DRIVER	I	142		D	
SALESMAN, REAL ESTATE	I	144	D		
SALESPERSON, FURNITURE	II	118		D	
SALESPERSON, GENERAL HARDWARE	II	120		D	
SALESPERSON, SPORTING GOODS	II	124		D	
SHOE REPAIRMAN	II	130	D		
STATISTICAL-MACHINE SERVICEMAN	II	134		D	
TELEVISION SERVICE-AND-REPAIRMAN	I	166		D	

	VOL.	PAGE	SATISFIED	LIKELY SATISFIED	LIKELY SATISFIED
CLUSTER X -- ACHIEVEMENT-AUTONOMY-SECURITY					
ACCOUNTANT, COST	I	18	.	0	.
CLAIM EXAMINER	I	52	.	0	.
COLLECTOR (MILL COLLECTOR)	II	50	.	0	.
COMMERCIAL ARTIST, ILLUSTRATING	I	50	.	0	.
DEPARTMENT HEAD, SUPERMARKET	II	50	.	0	.
DIE MILLER	I	64	.	0	.
ELECTRICAL ENGINEER	II	60	.	0	.
ENGINEER, CIVIL	I	70	.	0	.
ENGINEER, MECHANICAL	I	78	.	0	.
ENGINEER, TIME STUDY	I	82	.	0	.
HIGHWAY ENGINEER	II	70	.	0	.
LIBRARIAN	I	92	D	.	.
NURSE, PROFESSIONAL	I	108	.	0	.
PHARMACIST	I	118	.	0	.
PHYSICAL THERAPIST	I	122	D	.	.
PROGRAMMER (BUSINESS, ENGINEERING AND SCIENCE)	I	132	.	0	.
STATISTICIAN, APPLIED	I	158	.	0	.
WRITER, TECHNICAL PUBLICATIONS	I	178	.	0	.
CLUSTER XI -- ACHIEVEMENT-AUTONOMY-SOCIAL SERVICE					
CASEWORKER	I	46	D	.	.
COUNSELOR, SCHOOL	I	60	D	.	.
COUNSELOR, VOCATIONAL REHABILITATION	I	62	D	.	.
FLORAL DESIGNER (FLORIST)	II	64	D	.	.
INSTRUCTOR, VOCATIONAL TRAINING (BUS. SCHOOL)	II	74	.	D	.
PHOTODUPPLICATOR, COMMERCIAL	II	106	D	.	.
TEACHER, ADULT EDUCATION	II	136	D	.	.
TEACHER, ELEMENTARY SCHOOL	I	162	D	.	.
TEACHER, SECONDARY SCHOOL	I	164	D	.	.
CLUSTER XII -- ACHIEVEMENT-AUTONOMY-SOCIAL SERVICE- RECOGNITION-VARIETY					
ACCOUNTANT, CERTIFIED PUBLIC	II	18	.	D	.
ARCHITECT	II	28	D	.	.
INSTRUCTOR, VOCATIONAL SCHOOL	I	88	D	.	.
INTERIOR DESIGNER AND DECORATOR	II	76	D	.	.
NEWSPAPER PUBLISHER (WEEKLY AND SEMI-WEEKLY)	II	98	.	D	.
OCCUPATIONAL THERAPIST	I	110	D	.	.
OPTOMETRIST	II	100	.	D	.
SALESMAN, LIFE INSURANCE	II	116	D	.	.
SALESMAN, SECURITIES	I	146	.	0	.

the Work Adjustment Project with a rich data source. These data have been and are currently being utilized in the testing of a variety of research hypotheses. In addition to the service to DVR counselors being provided by the program, the program is also the source of contributions being made to the research literature in vocational rehabilitation and vocational psychology.

In 1966, the program served a few hundred clients from the Twin City DVR local offices. The pilot nature of the program was changed to a contractual research-service relationship between DVR and Work Adjustment Project in 1968. In calendar 1968, assessment services were provided by 2 psychometrists in 5 locations, serving 23 local offices and over 1,400 clients. This year (1971-72), assessment services are being provided by 14 psychometrists working in 23 locations, serving 45 local offices and approximately 3,000 clients. This growth is some measure of the success met by the Work Adjustment Project in making practical application of the Theory of Work Adjustment.

The DVR Follow-Up Survey

The original impetus for the Work Adjustment Project was the realization, after an extensive survey of the rehabilitation literature in 1957-58 (Dawis, England, Lofquist and Hakes, 1958), that the most critical need for vocational rehabilitation research at that time was the development of criterion measures for, and a methodology for the evaluation of, vocational rehabilitation outcomes. At that time, the outcome measures invariably used were such "quantity" measures as: number of cases closed; number placed in employment; total wages earned (usually with some estimate of total taxes paid); and number still employed thirty days after placement. A common complaint concerned the unavailability of "quality" measures of rehabilitation outcome, such as client satisfaction and client satisfactoriness. An early objective of the Work Adjustment Project, therefore, was the development of measures of employee satisfaction and employee satisfactoriness (Carlson, Dawis, England and Lofquist, 1962, 1963). The results have been the Minnesota Satisfaction Questionnaire (MSQ; Weiss, Dawis, England and Lofquist, 1967) and the Minnesota Satisfactoriness Scales (MSS; Gibson, Weiss, Dawis and Lofquist, 1970).

In 1968, the Minnesota Division of Vocational Rehabilitation wanted to obtain information about the longer range outcomes of rehabilitation for its clients, more information than was provided by the usual HEW R-300 closure forms. DVR asked the Work Adjustment Project to conduct a follow-up survey of its clients seeking answers to the following questions:

1. Do clients who were rehabilitated by DVR stay employed?
2. What kinds of jobs do they obtain?
3. Do they stay on the same jobs?
4. Do they work full-time on their jobs?
5. Are they satisfied with their jobs?
6. Are they satisfactory workers?
7. Do they become self-supporting?
8. Are their earnings competitive with other workers?

In other words, DVR wanted both "quantity" and "quality" measures of rehabilitation outcome obtained about its clients.

The method chosen to accomplish these objectives was the mail questionnaire survey. A survey questionnaire, the Minnesota Survey of Employment Experiences (MSEE; Tinsley, Warnken, Weiss, Dawis and Lofquist, 1969) was designed to obtain information on:

1. the client's work experience prior to acceptance by DVR;
2. the client's work experience from the time DVR closed his case to the time of the survey;
3. the client's current employment status, including type of job held, place of employment, and pay rate;
4. the client's satisfaction with his current employment (using the short-form MSQ as the measure); and
5. other items of interest such as educational experiences since closure and satisfaction with first job since closure.

The survey population of interest consisted of all former DVR clients whose cases were closed as "rehabilitated" (gainfully employed in a remunerative occupation) between July 1, 1963 and June 30, 1967. To serve as controls, a small group of former clients closed as "not rehabilitated" during the same period and a small group of co-workers of employed (at the time of the survey) "rehabilitated" former DVR clients were also surveyed.

Each individual in the survey groups was sent a questionnaire (the MSEE). Non-respondents were followed up at least three times by mail and once by telephone (for those whose phone numbers were available). Participation in the survey was voluntary, and the unwillingness of some to participate was respected. A total of 4,912 out of 6,435 former clients responded to the survey. Complete and usable information was obtained for 3,977 individuals.

In addition, ratings of job satisfactoriness were obtained for a representative group of currently employed former DVR clients and a matched group of their co-workers. Names of individuals for the latter group were obtained from the former DVR clients or their supervisors. For these two groups, the representative group of former DVR clients and their co-workers, ratings of their satisfactoriness as employees were obtained from their supervisors, using the MSS as the measure.

The survey was conducted in the summer of 1968 (June 16 through September 15). The findings of the survey are reported in Tinsley, et al., "A follow-up survey of former clients of the

Minnesota Division of Vocational Rehabilitation." *Minnesota Studies in Vocational Rehabilitation*, 1969, Number XXVI.

Briefly, the following are the major findings of the survey:

1. At the time of follow-up (which, for some, was as long as five years after closure), 81% of the rehabilitated former DVR clients were employed, an increase of 53% over their employment rate at acceptance.
2. At acceptance, employed DVR clients held mainly manual and service jobs. At closure, 40% (vs. 26% at acceptance) of the rehabilitated DVR clients were employed in professional, technical, managerial, clerical, and sales occupations. At follow-up, 45% of the rehabilitated group were in these occupations.
3. Three-fourths of the rehabilitated group of DVR clients reported having held no more than two jobs since closure. Those who had been closed earlier tended to have held more jobs than those who had been closed recently.
4. Over 91% of employed former DVR rehabilitants worked full time (35 hours or more) at their jobs.
5. A sample of employed former DVR clients was found to be just as satisfied with their jobs as their co-workers. Only a very small percentage (less than 2%) were "not satisfied," while 16% were only "slightly satisfied."
6. This sample of employed former DVR clients was generally rated by their supervisors as slightly less satisfactory (on the average) than their co-workers. However, only a small percentage (6.3%) of the DVR clients were rated "below average," the large majority of them being rated "average" in job satisfactoriness.
7. At acceptance, one-fourth of the total group of rehabilitated DVR clients were on public assistance. At follow-up, only one in seven was receiving public assistance. At acceptance, the typical rehabilitated DVR client had no income; at closure, his average monthly income was approximately \$275; and at follow-up, monthly earnings averaged \$345.

8. On the average, employed former DVR rehabilitants earned annual incomes that were only \$450 lower than their co-worker counterparts. However, both the DVR clients and their co-workers had average annual incomes which were considerably lower (more than \$2,000 lower) than the average U.S. annual income.

These findings objectively show the degree of rehabilitation success, in both its "quantitative" and "qualitative" dimensions, that was obtained by Minnesota DVR with these former clients. The large amount of information gathered by the survey, the short length of time required to obtain the information, and the low cost at which the information was obtained, all point up the feasibility of conducting follow-up evaluations of the kind described here, not only on a one-time basis but (of even greater value) on a regular periodic basis. The DVR Follow-up Survey is another illustration of the application of the *Theory of Work Adjustment* and its instruments to an important aspect of the vocational rehabilitation program — its evaluation.

The Vocational Assessment Clinic

The two previous examples concerned the application of the *Theory of Work Adjustment* to the problems of assessment and program evaluation. A third example to be described below concerns the application of the *Theory of Work Adjustment* to vocational counseling in the context of a Vocational Assessment Clinic.

The occasion for the creation of a pilot Vocational Assessment Clinic was a request for assistance from the University's Department of Civil Service Personnel. The Department had become increasingly concerned over the lack of special services in the area of vocational planning and counseling for the University's 8,500 Civil Service employees. A number of meetings were held, to which Work Adjustment Project staff were invited. The meetings resulted in a decision to conduct a pilot project to pretest the feasibility of providing special services in the vocational development area.

The plan was simple and straightforward. Ten University Civil Service employees would be selected for special services on the basis of two criteria: less than 12th grade education and apparent motivation to improve oneself vocationally. The Work Adjustment Project would provide vocational assessment, counseling and planning. Vocational planning would include a specification of special services needed by the employee. Special services would then be provided by appropriate University units, such as the Reading and Study Skills Center.

To prepare for the Vocational Assessment Clinic, the Work Adjustment Project developed a set of operating procedures divided into five phases:

- Phase I: On-the-Job Contact — in which the program is explained to the employee (in familiar, non-threatening surroundings) and he is instructed on what to do next.
- Phase II: Pre-assessment Counseling — in which vocational goals and expectations are explored with the employee; his background and experience, both educational and occupational; and specifically his experience with and reaction to psychological testing.

- Phase III: Vocational Assessment — in which the employee is helped and encouraged to learn more about himself through standard psychometric instruments.
- Phase IV: Planning — in which information from the preceding phases is reviewed and plans are cooperatively made for individualized learning programs.
- Phase V: Individualized Learning Program — in which the employee is provided with learning experiences designed to help him achieve his immediate vocational objective.

A sixth phase, Evaluation, was conducted informally to determine how successful each employee was in attaining his immediate vocational objective.

Two Work Adjustment Project staff members, both advanced graduate students in counseling psychology, served as the vocational counselors in the Vocational Assessment Clinic.

The 10 Civil Service employees consisted of 7 men and 3 women, ranging in age from 22 to 48 years and in education from 6 to 11 years. Two of the 10 were interested mainly in improving basic skills (reading, spelling) while the remaining 8 set as their goal the attainment of high-school-graduate-equivalent standing through passing the GED examinations.

The latter 8 employees were administered, in varying combinations depending on indication, the GATB, the MIQ, the WAIS and the Gates Reading Survey. Test information was used, in conjunction with interview information, to assess strengths and weaknesses with respect to taking the GED examinations.

The individualized learning programs were provided by the Reading and Study Skills Center, under the guidance of two special education specialists. Of the 8 employees, four lost interest or otherwise dropped out of the program, one took and passed all GED tests, one passed three and one passed one GED tests (both are continuing to prepare for the remaining GED tests) and one employee, starting with a reading attainment level of less than 3.5 years, has progressed spectacularly after faithfully attending 54 hour-long sessions, has transferred to the Public Service Careers Program, continues to work on his study skills, and has recently had the satisfaction of seeing published a letter he wrote to a newspaper. His was probably the most successful outcome of the four "successes."

In vocational counseling with the Civil Service employees, the *Theory of Work Adjustment* has served as a useful frame of reference. Thus, assessed vocational abilities have provided clues as to strengths to capitalize on in training as well as clues to weaknesses in skills which training could improve. Likewise, the MIQ and the counseling interview have provided clues as to the employee's motivation in terms of reinforcers which might be effective for the individual. (For example, in two of the three MIQs given, Advancement appeared as a "high" score, and both individuals concerned later on turned out to be "successes." On the third MIQ, the high invalidity score raised the suspicion, later confirmed, that the employee could not read functionally.)

While the experience of the pilot Vocational Assessment Clinic is quite modest and quite limited, it does demonstrate the feasibility of such an enterprise. It shows that the *Theory of Work Adjustment* can serve as a useful frame of reference by which to organize vocational counseling services, and that the *Theory of Work Adjustment* instruments can be useful tools in vocational counseling.

There have been other applications of the *Theory of Work Adjustment* and its instruments in areas other than rehabilitation and counseling. Several of these have already been mentioned; for example, their use in personnel management, in student selection and placement, and in a variety of research settings. These many applications, in fields other than the fields of rehabilitation and counseling, are important by-products of the Work Adjustment Project. However, the most important products of the Project are and have been its contributions to theory, knowledge, methodology, and technology in the fields of vocational rehabilitation and vocational psychology. The extent of these contributions can be appreciated by perusing the Appendices which follow. These Appendices are: Summaries of the Monographs in the *Minnesota Studies in Vocational Rehabilitation* series (Appendix A), Research Reports of the Work Adjustment Project (Appendix B), Doctoral Dissertations related to Work Adjustment Project Research (Appendix C), Publications stemming from Work Adjustment Project Research (Appendix D), Computer Programs developed by the Work Adjustment Project (Appendix E), and Sample Pages of Instruments developed by the Work Adjustment Project (Appendix F).

A final listing (Appendix G), of which the principal investigators are particularly proud, is the roll of present and past staff members of the Work Adjustment Project.

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Appendixes

Appendix A

**Summaries of the Monographs in the
Minnesota Studies in Vocational Rehabilitation Series
(continuing from Seven Years
of Research on Work Adjustment)**

XXI. Instrumentation for the Theory of Work Adjustment

Monograph XXI describes the development of the instruments required to operationalize the *Theory of Work Adjustment*. The monograph was based on data obtained from 2,042 men in six occupational groups representing a wide range of occupational fields and levels.

Both predictor and criterion variables were measured. The predictor variables of vocational abilities and vocational needs were measured by the General Aptitude Test Battery and a pair comparison form of the Minnesota Importance Questionnaire respectively. The criterion measures of job satisfactoriness and job satisfaction were based on previous Work Adjustment Project instruments. The measure of satisfactoriness was a set of 29 items, completed by the supervisors of individuals in the study. The measure of satisfaction was a twenty item short form of the Minnesota Satisfaction Questionnaire.

Results of the analyses of predictor variables indicated that: 1) scale intercorrelations were lower for the pair comparison form than for previous forms; 2) differentiation among individuals was better for the pair comparison form; 3) the pair comparison form differentiated among groups in meaningful ways; 4) the ability test scores were highly reliable but scale scores were highly intercorrelated; and 5) ability tests differentiated among occupational groups to a lesser extent than needs. The analyses relating abilities and needs indicated that the relationships were low, in support of the *Theory of Work Adjustment*.

Results of the analyses of criterion variables suggested that: 1) the twenty item satisfaction questionnaire yielded an intrinsic and an extrinsic factor; 2) the short form of the MSQ differentiated among occupational groups in level of satisfaction; 3) the 29-item satisfactoriness questionnaire yielded four highly reliable scales; and 4) occupational norms may be necessary in using the satisfactoriness instrument. Analyses of the two criterion variables suggested that satisfaction and satisfactoriness are independent sets of variables.

XXII. Manual for the Minnesota Satisfaction Questionnaire

Monograph XXII describes the development and use of the Minnesota Satisfaction Questionnaire (MSQ). Two forms of the MSQ are available, a 20-item three-scale form (Intrinsic, Extrinsic and General Satisfaction) and a 100-item twenty-one scale form (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, Working Conditions, and General Satisfaction).

The long form of the MSQ can be administered in 15-20 minutes, and the short form in 5 minutes. The MSQ has a fifth grade reading level; meets the accepted standards for reliability; and shows evidence of validity. The MSQ provides a quality outcome measure against which counselors and/or techniques can be evaluated.

Normative data on the MSQ are presented for the following occupational groups: accountants, buyers, engineers, field representatives, managers, licensed practical nurses, full-time nurses, part-time nurses, supervisor nurses, social workers, teachers, bookkeepers, business machine operators, office clerks, secretaries, stenographers and typists, hospital food service workers, housekeeping aides, nursing assistants, toy assemblers, laborers, packers, small equipment operators, truck drivers, and warehousemen.

Copies of both the long form and the short form of the MSQ can be purchased by individuals or vocational rehabilitation agencies conducting research on job satisfaction or conducting outcome or evaluation studies. A description of the proposed use of the MSQ must accompany the request.

XXIII. A Theory of Work Adjustment (A Revision)

The present monograph contains a revision of the *Theory of Work Adjustment* which had been proposed in an earlier monograph. The monograph contains the definitions for the major dimensions of both the work personality and the work environment. The monograph also contains nine formal propositions, stated in operational terms, about work adjustment.

The *Theory of Work Adjustment* is based on the concept of the correspondence between the individual and the environment. Correspondence is described in terms of the individual fulfilling the requirements of the work environment, and the work environment fulfilling the requirements of the individual. The individual is described in terms of his vocational abilities and needs, and the work environment, in terms of ability requirements and occupational reinforcers.

Correspondence between abilities and ability requirements is used to predict job satisfactoriness. Correspondence between needs and occupational reinforcers is used to predict job satisfaction. Satisfactoriness and satisfaction, taken together, can be used to predict job tenure.

XXIV. Occupational Reinforcer Patterns (First Volume)

This monograph contains Occupational Reinforcer Patterns (ORPs) for 81 occupations. ORPs describe the work environment in terms of the same dimensions as those used in describing the individual's vocational needs. With the publication of this monograph, it is possible to calculate the correspondence between an individual's needs profile and occupational reinforcers in 81 different occupations.

The 81 ORPs were based on the judgments of 2,976 immediate supervisors of jobs in several hundred firms. The monograph contains the 81 ORP profiles, statements interpreting each ORP, cross-references to ORPs with similar profiles, and information on the similarities and differences among the 81 ORPs. ORPs are available for occupations ranging from Airplane Stewardess and Fire Fighter, to Occupational Therapist and Heavy Equipment Operator.

The Occupational Reinforcer Patterns presented in this monograph completed the set of predictor variables specified by the *Theory of Work Adjustment*. Correspondence between needs and reinforcers is used in the prediction of job satisfaction. ORPs provide vocational counselors with descriptions of work environments in terms of differential patterns of reinforcers for different occupations.

XXV. The Measurement of Occupational Reinforcer Patterns

Monograph XXV presents the methodology used in developing the 81 ORPs contained in Monograph XXIV. The present monograph contains technical data on the development of the rating method for describing occupational reinforcers, procedures used in constructing an ORP, and reliability and validity data on the ORPs.

Data for each ORP were obtained by asking supervisors of each occupation to complete the Minnesota Job Description Questionnaire (MJDQ). The MJDQ is a multiple rank order instrument in which the supervisor is asked to rank the reinforcer characteristics of the job he supervises. ORPs were developed only for occupations for which twenty or more completed MJDQs were obtained.

Reliability studies showed that ORPs developed from subgroups of supervisors for an occupation were very similar to those obtained from other subgroups of the same occupation, and to the ORP obtained from the total occupational group. Evidence for the validity of the ORPs was obtained from occupational differences and similarities among the 81 ORPs. A cluster analysis of the 81 ORP profiles resulted in nine meaningful occupational clusters.

The use of the MJDQ was judged to be an efficient, reliable and valid method for obtaining ORPs for a variety of occupations. Monograph XXV contains a copy of the MJDQ and the descriptive characteristics of the supervisors of each of the 81 occupations.

XXVI. A Follow-up Survey of Former Clients of the Minnesota Division of Vocational Rehabilitation

The present monograph contains the results of a survey conducted by the Work Adjustment Project on all clients of the Minnesota Division of Vocational Rehabilitation whose cases were closed in the fiscal years 1963 through 1967. Almost 5,000 responded, representing a 76% return of those with correct addresses available.

The following are the major findings of the survey: 1) at follow-up, 81% of the rehabilitated former DVR clients were employed compared with 28% at acceptance; 2) at follow-up, larger percentages of individuals were employed in higher level jobs than at acceptance; 3) 75% of the rehabilitated clients reported having had no more than two jobs since closure; 4) over 91% of employed rehabilitants worked full time at their jobs; 5) in a comparison of the job satisfaction of a sample of DVR clients and their co-workers, former DVR clients were found to be as satisfied as co-workers; 6) this sample of employed former clients was generally rated by supervisors as satisfactory but as slightly less satisfactory than their non-handicapped co-workers; 7) at follow-up, fewer individuals were on public assistance and monthly earnings were higher than at acceptance; and 8) employed former DVR clients earned annual incomes that were only \$450 lower than their co-workers.

XXVII. Manual for the Minnesota Satisfactoriness Scales

This monograph describes the development and use of the Minnesota Satisfactoriness Scales (MSS). The MSS is a 28-item questionnaire, completed by a worker's supervisor, which is scored on five scales — Performance, Conformance, Dependability, Personal

Adjustment and General Satisfactoriness. The MSS can be completed in approximately five minutes.

The monograph contains norms for the following occupational groups: Professional, Managerial and Technical; Clerical and Sales; Service; Machine Trades and Bench Work; and Workers-in-General. The MSS was developed from supervisor ratings of 2,373 workers. The five MSS scales showed a median internal consistency reliability of .87. Median test-retest reliability for several job groups over a two-year interval was .50. A two-year study also provided evidence for the validity of the MSS as a predictor of job tenure.

The manual also contains a discussion on the use and interpretation of the MSS with respect to the occupational norms. The MSS can be used by an agency or a counselor in follow-up studies which evaluate the quality of counseling outcomes.

Copies of the MSS can be purchased by individuals or by vocational rehabilitation agencies conducting research on job performance or conducting outcome or evaluation studies. A description of the proposed use of the MSS must accompany the request.

XXVIII. Manual for the Minnesota Importance Questionnaire

This monograph describes the 1967 Revision of the Minnesota Importance Questionnaire (MIQ). Also included is a description of earlier instruments of the same type. The current MIQ is a 210-item pair-comparison instrument designed to measure an individual's vocational needs. The individual responds to the pairs of statements in terms of "Which is more important to me in my ideal job." The twenty scales of the MIQ are: 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.

An MIQ profile may be interpreted in terms of the importance to the individual of the twenty work reinforcers. 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 can also be interpreted in terms of similarity to the 148 Occupational Reinforcer Patterns (Monographs XXIV and XXIX) developed by the Work Adjustment Project.

The monograph contains extensive information on the reliability and validity of the MIQ. Median internal consistency reliabilities for

the twenty MIQ scales in several subject groups were generally in the 80's. Median stability coefficients for the twenty MIQ scales ranged from a high of .89 for an immediate retest to a low of .48 for a six-month retest. Validity data include content validity studies, group difference studies and concurrent validity studies.

The monograph is intended to serve as a manual for vocational psychologists, work evaluators, rehabilitation counselors and counseling psychologists who are using the MIQ. The manual contains information on the administration, use and interpretation of the MIQ. Copies of the instrument and/or permission to use the MIQ Scoring Service can be obtained. Requests must include a description of the proposed use of the instrument.

XXIX. Occupational Reinforcer Patterns (Second Volume)

This monograph contains Occupational Reinforcer Patterns (ORPs) for an additional 67 occupations. Combined with the 81 ORPs in Monograph XXIV, descriptions of occupational reinforcers (rewards) are available for 148 occupations. The present monograph is intended to serve as a companion volume to the First Volume of ORPs. The ORPs in the Second Volume were developed from the responses to the Minnesota Job Description Questionnaire (MJDQ) of supervisors and/or employees in each of the 67 occupations. A total of 2,059 raters was used in producing the 67 ORPs.

Appendix B

Research Reports of the Work Adjustment Project

1. Dawis, R.V. The Minnesota Studies in Vocational Rehabilitation. *Rehabilitation Counseling Bulletin*, 1967, 11, 1-10.

The first ten years of the Work Adjustment Project were described and outlined: 1) Period I (1957-1959) focused on the delineation of the research area for the *Minnesota Studies in Vocational Rehabilitation*; the term "work adjustment" was chosen; 2) Period II (1959-1963) included extensive literature reviews, survey research on the disabled, and a definition of work adjustment; and 3) Period III (1963-1967) began with the publication of a formal theory, included research planning and design to operationalize the theory and test hypotheses derived from the theory. The *Theory of Work Adjustment* was described in detail with implications for the practice of placement in vocational rehabilitation counseling. Past and future contributions of the Work Adjustment Project in vocational rehabilitation technology were discussed.

2. Fisher, S.T., Weiss, D.J. & Dawis, R.V. A comparison of Likert and pair comparisons techniques in multivariate altitude scaling. *Educational and Psychological Measurement*, 1968, 28, 81-94.

The present study compared two scaling techniques, the Likert method and the pair comparisons method, in the measurement of vocational needs. The instruments used in the study were two forms of the Minnesota Importance Questionnaire (MIQ). Various psychometric characteristics of the two methods were compared and relationships between scales developed by the two methods were investigated. Results indicated: 1) Likert scale means were more extreme; 2) Likert scale variabilities were smaller; 3) both types of scales had median scale reliabilities in the 80's; 4) Likert scales produced negatively skewed, peaked distributions, while pair comparisons distributions were flat; and 5) pair comparisons scales were more independent. The authors concluded that pair comparison scales have more advantages than Likert scales.

3. Ace, M.E. & Weiss, D.J. Ipsativity and predictability. Paper presented at the 75th Annual Convention of the American Psychological Association, 1967. (Mimeographed)

Distinctions were made among non-ipsative, partially ipsative, and purely ipsative data. A review of several assessment studies indicated that researchers often had failed to specify the type of

ipsativity dealt with. The present study explored the predictive validities of partially ipsative scores and experimentally derived purely ipsative scores from the Minnesota Importance Questionnaire (MIQ). Multiple regression analyses were used with the two sets of MIQ scale scores as the independent variables and three measures of job satisfaction as the dependent variables. Results were inconclusive since the MIQ scales did not predict the three job satisfaction criteria consistently. However, even though the predictions were not statistically significant, the scale scores derived from purely ipsative data did predict as well as the scale scores derived from partially ipsative data.

4. Dawis, R.V., Weiss, D.J., Lofquist, L.H., & Betz, E. Satisfaction as a moderator in the prediction of satisfactoriness. *Proceedings, 75th Annual Convention of the American Psychological Association*, 1967, 269-270.

The present study investigated the use of job satisfaction as a moderator variable in the prediction of job satisfactoriness from ability test scores. A short form of the Minnesota Satisfaction Questionnaire (MSQ) was used to measure satisfaction and eight ability tests from the Employee Aptitude Survey were used to measure abilities. Average productivity and supervisor evaluation of employee performance were used as the two satisfactoriness criteria for a sample of 352 assemblers. Linear multiple correlations were computed for each satisfaction subgroup within each sex group and for the total sex group. For the male group, coefficients of .63 and .69 were obtained for the "high" satisfaction subgroup while the "middle" and "low" satisfaction subgroups yielded multiple R's ranging from .34 to .52. For the female group, the results only partially supported the hypothesis under consideration. Conclusions were qualified because of the absence of cross-validation.

5. Kauppi, D.R. & Weiss, D.J. The utility of the classification "mentally retarded" in vocational psychology. *Proceedings, 75th Annual Convention of the American Psychological Association*, 1967, 347-348.

The present study investigated the assumption that mentally retarded individuals are different from non-retarded individuals on a set of vocationally relevant dimensions. Logical and empirical evidence was presented suggesting that the classification "mentally

retarded" is not of primary vocational significance, is neither an effective nor an efficient system, and leads to errors of great significance to the clients. Data collected through the Work Adjustment Project indicated that: 1) overlap in abilities between retarded and non-retarded classifications is moderate; and 2) individual differences in vocational needs of individuals classified as retarded approximates the variability of non-retarded groups.

6. Thorndike, R.M., Weiss, D.J. & Dawis, R.V. The canonical correlation of vocational interests and vocational needs. *Journal of Counseling Psychology*, 1968, 15 (2), 101-106.

Conceptual definitions of vocational interests generally postulate a high relationship between interests and other motivational constructs, e.g., needs. However, empirical studies have reported only low to moderate correlations between measurements of such constructs. One explanation for these findings might arise from the limitations imposed by the correlational techniques used. In the present study, canonical correlation was used to explore the relationship between interests and needs. A measure of vocational interests (Strong Vocational Interest Blank) and a vocational needs measure (Minnesota Importance Questionnaire) were administered to two groups of male subjects — one composed of students, and the other of vocational rehabilitation applicants. For each group, four different sets of orthogonal weights for the variables were found to yield significant canonical correlations. Maximum canonical correlations were .78 and .74 for the two groups respectively, supporting the conclusion that a high relationship exists between interests and needs.

7. Golden, R.R., Weiss, D.J. & Dawis, R.V. An evaluation of Jaspén's approximation for the distribution functions of the F, t, and chi-square statistics. *Educational and Psychological Measurement*, 1968, 28, 163-165.

The present study systematically investigated the accuracy of Jaspén's approximations for various degrees of freedom and for the most commonly used alpha levels. Jaspén's approximation was found to be quite accurate in most ranges of F and chi-square, and is extremely economical when dealing with a large number of computed statistic values. By using the accuracy tables provided in the paper, intervals of probability values which will lead to wrong decisions can be determined.

8. Graen, G.B., Dawis, R.V. & Weiss, D.J. Need type and job satisfaction among industrial research scientists. *Journal of Applied Psychology*, 1968, 52 (4), 286-289.

Need-fulfillment theories of job satisfaction generally assume that individuals differ in the outcomes they prefer (need) to obtain from their jobs. The hypothesis this study investigated was that the pattern of preferences for job outcomes moderates the relationship between preference for an outcome and satisfaction with that outcome. Questionnaires to assess preference and satisfaction on 30 different job outcomes were administered to 113 industrial research scientists working in one facility. Preference (need) ratings were subjected to Q-cluster analysis from which two "need" groups were identified. It was found that "need" type moderated the relationship between preference (need) for an outcome and satisfaction with that outcome only on those outcomes most closely related to the company itself. A hypothesis was proposed that these two "need" groups reflect the two types of research and development personnel that differ primarily in orientation toward the company itself.

9. Thorndike, R.M., Weiss, D.J. & Dawis, R.V. Multiple relationships between measured vocational interests and measured vocational needs. *Journal of Applied Psychology*, 1968, 52 (6), 491-496.

The data used in an earlier report (Number 9) was presented in more detail together with a revised and expanded review of the literature. The authors concluded that if the canonical correlation findings are confirmed, interests and needs cannot be treated as separate and distinct dimensions.

10. Carlson, R.E., Dawis, R.V. & Weiss, D.J. Satisfaction as a moderator of the relationship between abilities and satisfactoriness, 1969. (Mimeographed)

The present study was an expansion of an earlier study (Number 4) in which only one group of subjects was used. The present study included two groups: 1) 352 assemblers employed in one large manufacturing concern; and 2) 506 employed individuals tested through the Work Adjustment Project. The moderator effect hypothesis was operationalized in two ways: 1) when all individuals are on the same job, ability requirements of a job become constant; and 2) when workers are on different jobs, a measure of corre-

spondence between abilities and ability requirements of the job has to be used. The measurement instruments were identical to those used in the previous study. The results from the two groups lent empirical support to the *Theory of Work Adjustment* proposition that job satisfaction plays a moderator variable role in the relationship between measured ability and job satisfactoriness. Implications for selection and placement research also were noted.

11. Golden, R.R. & Weiss, D.J. Relationship of vocational satisfaction to the correspondence of job reinforcement and vocational needs, 1968. (Mimeographed)

The *Theory of Work Adjustment* proposes that vocational satisfaction is a function of the correspondence between the reinforcers in the work environment and the individual's vocational needs. The hypothesis was tested by comparing the means and variances of measures of satisfaction for groups differing in degree of need-reinforcer correspondence. The data were self-report responses of 179 individuals in various occupational positions to questionnaires measuring satisfaction, needs and reinforcer level on 20 dimensions of work. Statistical tests of the hypothesis were performed separately for each of the 20 dimensions. Support for the proposition was found on from 13 to 20 dimensions, depending on the specific statistical hypothesis tested.

12. Weiss, D.J. Computer-assisted synthesis of psychometric data in vocational counseling. Paper presented at symposium "Computers in Counseling" at the 76th Annual Convention of the American Psychological Association, 1968. (Mimeographed)

Given that effective counseling is based on the assessment of the significant aspects of a counselee's work personality, computerized techniques can be invaluable to the counselor. Rather than providing the counselor with an increase in the amount of information he must consider (which is a characteristic of most interpretive systems), synthesizing systems are oriented toward reducing the counselor's investment of time in mechanical data interpretation. Procedures for individualizing the process of vocational assessment were outlined with special emphasis on the measurement of vocational needs and abilities.

13. Borgen, F.H. & Weiss, D.J. Supervisor perceptions of occupational environments and Roe's classification of occupations. Paper presented at the 76th Annual Convention of the American Psychological Association, Division 17, 1968. (Mimeographed)

The present study evaluated Roe's taxonomic system for the classification of occupations on the basis of an external, empirically derived criterion measure. The procedure used was one of obtaining information about 81 specific occupations on the kinds of dimensions which are seen as defining Roe's classification of level. The Minnesota Job Description Questionnaire (MJDQ) was used to obtain the differential reward characteristics of the 81 occupations. Immediate supervisors were selected as the appropriate raters of the occupational reinforcers. The 81 occupations were classified into one of the six levels of Roe's classification and one-way analyses of variance were performed with the 22 reinforcer values from the MJDQ as dependent variables. The results of the study provided empirical confirmation for several of the dimensions which Roe had postulated as underlying her classification of occupational level. The results also supported the construct validity of the MJDQ as a measure of Occupational Reinforcer Patterns.

14. Weiss, D.J. & Dawis, R.V. A multivariate prediction technique for problems involving multi-functional predictor-criterion relationships. *Proceedings, 76th Annual Convention of the American Psychological Association*, 1968, 229-230.

The present study outlined a multivariate prediction technique which does not impose a linear relationship on the predictor-criterion relationship. The reciprocal averages prediction technique (RAPT) was shown to have several advantages over linear multiple regression. RAPT can handle either linear or non-linear predictor-criterion relationships, or combinations of both. RAPT can be used with categorical or continuous data or combinations of both. Linear multiple regression and RAPT were compared in three studies and results indicated that prediction with RAPT is as good as linear multiple regression for problems involving linear relationships, and better for problems involving nonlinear relationships.

15. Hendel, D.D. & Weiss, D.J. Individual response consistency and stability of measurement. *Proceedings, 76th Annual Convention of the American Psychological Association*, 1968, 249-250.

The traditional model of psychometric reliability ignores the possibility of the measurement of individual differences in reliability and the identification of individual factors which reflect differential reliability of measurement. The present study investigated the extent to which the total circular triads (TCT) score in pair comparisons scaling can differentiate between individuals with respect to reliability of measurement. The Minnesota Importance Questionnaire (MIQ) was administered to 180 high school seniors and the TCT score was derived from the MIQ. The relationship between TCT and reliability was examined in terms of scale internal consistency reliability, scale test-retest reliability and individual test-retest profile stability. Results indicated that the TCT score can be used as the basis for predicting differential reliability of measurement for individuals. The authors concluded that individuals with low TCT scores have more stable preference systems, while individuals with high TCT scores exhibit lower reliability of measurement.

16. Borgen, F.H. & Weiss, D.J. An application of the method of multiple rank orders to the scaling of environmental characteristics. *Proceedings, 76th Annual Convention of the American Psychological Association*, 1968, 197-198.

The present study outlined the development of the Minnesota Job Description Questionnaire (MJDQ) as a tool for measuring the reinforcers present in the work environment. The need for such a tool was based on the *Theory of Work Adjustment* concept of correspondence between needs and reinforcers as a predictor of job satisfaction. The MJDQ was administered by mail, to 3,106 supervisors of 81 different jobs. Analysis of the resulting MJDQ data was designed to investigate the validity of the multiple rank order scaling method for the environmental stimuli used in the MJDQ. Results indicated that: 1) supervisors could make consistent distinctions among stimuli; 2) there was high intra-job agreement among supervisors; 3) combined ratings of supervisors yielded reliable profiles; 4) ratings on the stimuli varied across the 81 jobs; and 5) job profiles clustered in meaningful ways.

17. Kauppi, D.R. The application of general semantics to the classification of mentally retarded. Paper presented at the International Conference on General Semantics, 1968. (Mimeographed)

Problems of mental retardation have been studied because of their theoretical and practical importance. The author examines current practices in mental retardation to determine if a sophisticated and useful classification system had been developed. Problems of definition and classification of the mentally retarded suggested that basic semantic principles were either ignored or misapplied in the process of establishing the classification system. The author concluded that most classification problems had arisen from the ignoring of substantial inter-individual and intra-individual differences of persons classified as mentally retarded.

18. Betz, E.L. Need-reinforcer correspondence as a predictor of job satisfaction, *Personnel and Guidance Journal*, 1969, 47 (9), 878-883.

The "good fit" principle was applied to the prediction of job satisfaction, based on a proposition of the *Theory of Work Adjustment* that satisfaction is a function of the "correspondence" between an individual's vocational needs and job reinforcers. Measures of needs, job reinforcers, and job satisfaction were administered to three groups of store employees. Five indices of need-reinforcer correspondence were calculated for each individual and applied as predictors of job satisfaction. For cashiers and salesclerks, correspondence measures correlated as high as .37 and .45 respectively with job satisfaction; "hit rates" were as high as .68 and .73 respectively. Results for the checker-makers were not significant.

19. Hendel, D.D. & Weiss, D.J. Individual inconsistency and reliability of measurement. *Educational and Psychological Measurement*, 1970, 30 (3), 579-593.

Total circular triad scores (TCT) derived from the pair-comparison Minnesota Importance Questionnaire (MIQ) were used to study the relationship between inconsistency and both internal consistency reliability and test-retest reliability. Hoyt reliability coefficients and stability coefficients were computed for each of nine

groups (retest intervals from an immediate retest to 10 months) for the 20 MIQ scales; stability estimates were also computed for each individual. Results showed that scale stability and individual stability coefficients, as well as internal consistency reliabilities, were higher for low TCT groups. Correlations between individual stability and TCT were from $-.24$ to $-.68$. The results replicated a previous study (Number 15) and indicated that reliability estimates are related to individual differences in response consistency.

20. DeWitt, L.J. & Weiss, D.J. Applications of circular triad data in individual measurement. *Proceedings, 77th Annual Convention of the American Psychological Association*, 1969, 147-148.

Total circular triad (TCT) scores from the pair-comparison Minnesota Importance Questionnaire were analyzed in terms of the twenty associated stimulus circular triad scores. A chi-square statistic was calculated for each individual to separate individuals with TCT scores in the random range (≥ 255) into those with truly random responses and those with pseudo-random response due to difficulty of discrimination among the stimuli. Using similar methodology for individuals whose TCT scores were not in the random range, error bands were developed indicating a range of indecision for each scale value of an individual. The results were used in the interpretation of pair comparison scale values for individuals.

21. Nitardy, J.R., Peterson, C.D. & Weiss, D.J. Differential influence of test format variables on ability test performance. *Proceedings, 77th Annual Convention of the American Psychological Association*, 1969, 139-140.

It was hypothesized that the elimination of separate answer sheets and provision of extra practice items would differentially affect test performance of groups at differing "general ability" levels. Four tests of different abilities from the General Aptitude Test Battery were administered to four groups chosen to represent different ability levels. Independent variables were standard IBM answer sheet versus no separate answer sheet and standard number of practice items versus twice the standard number. The fact that the results supported the hypothesis was discussed with regard to implications for testing vocational aptitudes of various "culturally different" populations.

22. Taylor, K.E. & Weiss, D.J. Prediction of individual job turnover from measured job satisfaction. *Proceedings, 77th Annual Convention of the American Psychological Association*, 1969, 587-588.

The Minnesota Satisfaction Questionnaire (MSQ) was administered to a group of 475 employees of a chain discount store. After a lapse of one year, personnel records indicated about 20% of the sample had terminated. "Leavers" were significantly less satisfied on over one-third of the MSQ scales. A discriminant function using MSQ scores as predictors was developed on one group of the employees and applied to a cross-validation group. The hit-miss tables indicated a significant relationship between predicted and actual termination for both the development and cross-validation groups.

23. Warren, L.W. & Weiss, D.J. Relationship between disability type and measured personality characteristics. *Proceedings, 77th Annual Convention of the American Psychological Association*, 1969, 773-774.

Minnesota Multiphasic Personality Inventory scale scores were analyzed for nine disability groups and one non-disabled comparison group in order to investigate the relationship between disability group membership and objectively measurable personality characteristics. Disabilities represented were: arthritis and rheumatism, character disorders, epilepsy, heart disease, mental retardation, orthopedic impairment of back, orthopedic impairment of lower limbs, psychoneurotic disorders, and schizophrenic disorders. Support was found for the dimensional hypothesis that personality characteristics differ for different disability groups, but no support was found for the typological hypothesis that there are personality types that correspond to disability types.

24. Kauppi, D.R. & Weiss, D.J. Comparison of single item and triad verification keys for the MVII. *Proceedings, 77th Annual Convention of the American Psychological Association*, 1969, 149-150.

Single item and triad scoring keys were used in developing seven infrequent response verification scales for the Minnesota Vocational Interest Inventory (MVII). The longest triad scale (99 items) showed small but consistent superiority to the equivalent length single item

scale in discriminating valid questionnaires from those produced at random, by females, and by mentally retarded individuals. Triad scales identified illegitimate response patterns, and were sensitive to unlikely combinations of preferences rather than simply low base rate endorsements. A cutting score on the longest triad scale set to identify 95% of the valid MVII's correctly identified 92% of the random questionnaires.

25. Kauppi, D.R. & Weiss, D.J. Efficiency of commonly used measures in predicting inventory validity. *Proceedings, 77th Annual Convention of the American Psychological Association*, 1969, 691-692.

School grade completed, GATES Reading subtest scores, and scores on the vocabulary and tool matching subtests of the GATB were compared in the efficiency with which they could predict scale scores on three inventories (Minnesota Vocational Interest Inventory, Minnesota Multiphasic Personality Inventory, and Minnesota Importance Questionnaire). Overlap between predictor score distributions of valid and invalid inventories varied among predictors and among inventories. Substantial differences in predictive efficiency were found, with GATES comprehension score more effective for most predictions patterned after prediction problems faced by the practicing counselor.

26. Reed, M.H. & Weiss, D.J. Counseling outcomes for mentally retarded clients, 1969. (Mimeographed)

Counseling outcomes for 586 mentally retarded and 2,827 non-retarded rehabilitation clients were compared in terms of work status, occupation and earnings. The retarded were significantly different from the non-retarded in work status and occupation at closure. Slightly more retarded were gainfully employed, and more were in service occupations. Weekly earnings of the retarded were less than those of the non-retarded. The retarded were younger and took a shorter time in counseling. Results suggested the need for better evaluation of the work personalities of mentally retarded counselees.

27. Thorndike, R.M. & Weiss, D.J. An empirical investigation of stepwise canonical correlation. Paper presented at the 42nd Annual Convention of the Midwestern Psychological Association, 1969. (Mimeographed)

The study was designed to introduce a method for eliminating superfluous variables from canonical variate analyses in both component and prediction studies. A group of 500 males completed the Minnesota Vocational Interest Inventory (MVII) and the Minnesota Importance Questionnaire (MIQ). Scales were dropped, one at a time, from both instruments and the new set of beta weights for the first pair of canonical variates was submitted to cross-validation. The results suggested that stepwise canonical correlation is not only feasible but may be desirable for some current applications of canonical correlations analysis.

28. Weiss, D.J. Occupational reinforcers, vocational needs, and job satisfaction. Special presentation at the 77th Annual Convention of the American Psychological Association, Division 14, 1969. (Mimeographed)

The present paper discussed Work Adjustment Project techniques and findings which have implications for problems of selection, placement and individual-organization interaction. The *Theory of Work Adjustment* was described in detail together with a discussion of Occupational Reinforcer Patterns, vocational needs and the correspondence between needs and reinforcers. Implications for industrial psychology were outlined.

29. Weiss, D.J. Individualized assessment of differential abilities. Paper presented at symposium "Computer-based assessment — implications for psychometric theory and practice" at the 77th Annual Convention of the American Psychological Association, Division 5, 1969. (Mimeographed)

The standardized test approach to psychological measurement and computer-based assessment are described and compared. Problems connected with the standardized test approach include non-standard administration due to uncontrolled variables, time limits as an administrative convenience, test-taking motivation of the individual, and the interpretation of the reliability of the test score. Computerized assessment, on the other hand, allows individualized input, individualized item sequences, increased precision of measurement, and can increase the individual's motivation by appropriate methods of feedback.

30. Taylor, K.D. & Weiss, D.J. Prediction of individual job termination from measured job satisfaction and biographical data. *Journal of Vocational Behavior*, 1972, 2, 123-132.

The present study is an expansion of a previous report (Number 22) on the use of satisfaction scores from the Minnesota Satisfaction Questionnaire (MSQ) in the prediction of job termination. The present study used four additional biographical items (age, number of dependents, education and sex) as possible predictors of job termination. Several discriminant functions were run using sets of the biographical data alone, the MSQ scales alone, and both biographical and satisfaction in combination, to predict job termination. Only the MSQ scales alone resulted in hit rates above the base rate in both the developmental and cross-validation groups.

31. Tinsley, H.E. & Weiss, D.J. Comparison of job reinforcer ratings of supervisors and supervisees, 1970. (Mimeographed)

The present report is an early version of another report (Number 39) on the comparison of employee and supervisor derived Occupational Reinforcer Patterns. The analyses contained in the present report are not as complete and detailed as those contained in the other report.

32. 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.

Adjusted scale values from the pair-comparison Minnesota Importance Questionnaire (MIQ) were used in a series of analyses of variance to investigate the relationship between race, demographic characteristics and vocational needs profiles. Results showed no significant racial differences on any of the 20 MIQ needs. A significant difference in circular triads, a measure of inconsistency of response, did appear. The eight demographic variables also failed to yield any significant differences on any of the 20 MIQ vocational needs. Results supported the interpretation of the confounding influence of socioeconomic status in studies of racial groups.

33. Gay, E.G. & Weiss, D.J. Relationship of work experience and measured vocational needs. *Proceedings, 78th Annual Convention of the American Psychological Association*, 1970, 663-664.

The Minnesota Importance Questionnaire was administered to 1,620 vocational rehabilitation clients. Scores on the 20 vocational need scales, four scores of the level of vocational needs, and total circular triads score were compared across different work experience groups by one-way analysis of variance. The results supported the hypotheses that: 1) persons with different amounts of work experience tended to have different levels of specific vocational needs; 2) the overall level of vocational needs differs with differing work experience; and 3) differing amounts of work experience result in different levels of clarity in the individual's vocational need structure.

34. Desmond, R.E. & Weiss, D.J. Measurement of ability requirements of occupations. *Proceedings, 78th Annual Convention of the American Psychological Association*, 1970, 149-150.

The Minnesota Job Requirements Questionnaire (MJRQ) was developed and administered to supervisors who rated the ability requirements of the job they supervised. In the MJRQ, each of the nine GATB aptitudes was represented by five Likert format items. Analyses demonstrated internal consistency and internal construct validity for MJRQ ratings in terms of several criteria including inter-group and intra-group differences. Occupational Aptitude Patterns (OAPs) were derived on empirical and rational bases and compared with GATB and DOT OAPs. The similarity in OAPs showed promise for the parsimonious MJRQ approach.

35. Thorndike, R.M. & Weiss, D.J. Parsimony of factor analytic methods for diverse scientific areas. *Proceedings, 78th Annual Convention of the American Psychological Association*, 1970, 111-112.

Parsimonious explanation of data is a major goal of scientific investigation. The ability of five methods of factor analysis to provide parsimony for data from six diverse scientific areas was examined on two criteria, number of factors and the P-index.

Differences were found across methods and across scientific areas on the P-index, while only differences across methods were found for the number of factors criterion. It was concluded that principal components with Kaiser criterion provides greatest parsimony and that psychological data were less amenable to parsimonious explanation than were data from other scientific areas.

36. Thorndike, R.M. & Weiss, D.J. Stability of canonical components. *Proceedings, 78th Annual Convention of the American Psychological Association*, 1970, 107-108.

Methodology has not kept pace with theory in canonical analysis. Canonical components have been suggested as being more stable and interpretable than sets of canonical weights. This study found canonical components to be very stable in cross-validation, even when the correlation between canonical variates dropped substantially. Replication did not necessarily result in stable canonical components. It was concluded that cross-validation showing stability of the canonical correlations or replication showing stability of the canonical components is necessary before the results of a canonical analysis can be considered meaningful.

37. Carlson, R.E., Dawis, R.V. & Weiss, D.J. The effect of satisfaction on the relationship between abilities and satisfactoriness. *Occupational Psychology*, 1969, 43, 39-46.

The present report is a revision of a previous report (Number 10) based on two groups of subjects. The results of the two studies lent empirical support to the hypothesis that job satisfaction affects the relationship between measured ability and satisfactoriness. The conclusions were qualified due to the absence of cross-validation samples and by the low correlation coefficients obtained for the women assemblers in the first study.

38. Vessey, T.M. & Hendel, D.D. Effects of lowered reading level and anchors on responses to the Minnesota Job Requirements Questionnaire, 1970. (Mimeographed)

Three versions of the Minnesota Job Requirements Questionnaire (MJRQ) were given to a sample of stenographers to determine what effects changes in statement wording and anchors would have on their responses. These changes were made to lower the reading level and to increase discrimination among the K, F and M ability

requirement dimensions. The MJRQ had been previously developed as an instrument to describe ability requirements for successful job performance in specific jobs. Results indicated that the simplified wordings and the revised anchors did not yield significant differences between groups. However, the hypothesis that discrimination between K, F and M abilities could be improved was supported for the K and F subtests of the MJRQ.

39. Tinsley, H.E.A. & Weiss, D.J. A multitrait-multimethod comparison of job reinforcer ratings of supervisors and supervisees. *Journal of Vocational Behavior*, 1971, 1 (3), 287-299.

The Minnesota Job Description Questionnaire was completed by 338 supervisors of nine jobs and 381 of their supervisees. The resulting Occupational Reinforcer Patterns (ORPs) were compared by correlational analysis and analysis of variance. ORPs from both groups had high split-group reliabilities. Strong support was obtained for the convergent and divergent validity of the civil engineer, elementary teacher, and radiologic technologist ORPs. Moderate support was demonstrated for the validity of the social caseworker, bank teller, automobile salesman, and salesman-driver ORPs, while the waiter-waitress and truck driver ORPs were found to be of questionable validity. The data suggested that supervisors and supervisees generally perceive reinforcer characteristics similarly, although the two groups of raters tended to disagree on the extrinsic reinforcers and on the reinforcer characteristics of lower level occupations.

40. Hendel, D.D. & Weiss, D.J. A comparison of MIQ and AVL profiles for applied and theoretical psychology graduate students, 1970. (Mimeographed)

Minnesota Importance Questionnaire (MIQ) and Allport-Vernon-Lindzey (AVL) scale scores were analyzed for "applied" and "theoretical" psychology graduate students entering the University of Minnesota in the Fall of 1968. Some support was found for the hypothesis that the MIQ can discriminate between need patterns for individuals in closely related professional occupations. Significant differences in mean MIQ scale values of the two groups were found for six of the 20 MIQ scales. The lack of group differences on the AVL scales supported the hypothesis that the AVL could not differentiate between the groups; the lowest p-value for the AVL scale scores was .18.

41. Anderson, L.M. & Weiss, D.J. Stability of measured work adjustment, 1971. (Mimeographed)

Measures of job satisfaction (Minnesota Satisfaction Questionnaire) and job satisfactoriness (Minnesota Satisfactoriness Scales) were tested for two-year stability on 1,508 employed adult men from six occupations. "Stayers" (70% of the total group) were individuals who were still on the same job with the same employer for the two years. Results for the "stayers" indicated only moderate stability for all measures. Stability for "stayers" was found to be related to occupation, age and tenure. In addition, the results for "stayers" suggested relationships between initial satisfaction level and stability of measured satisfactoriness and vice versa. Lower stabilities on both satisfaction and satisfactoriness for "changers" supported the hypothesized relationship of these variables to turnover.

42. Desmond, R.E. & Weiss, D.J. Comparison of worker and supervisor ratings of job ability requirements, 1971. (Mimeographed)

Ratings by 714 workers in 11 jobs, of the ability requirements of their jobs, were compared with ratings by 261 supervisors of the same jobs. The Minnesota Job Requirements Questionnaire, which represented GATB abilities, was used as the rating instrument. Worker ratings demonstrated a high degree of internal consistency, comparable to those of supervisors. Worker and supervisor ratings were highly similar in level and variability. Ratings by both groups compared favorably with "expert" ratings and with GATB empirical validity data. Implications of the similarity between workers and supervisors in subjective ratings were discussed, regarding future use of workers in job analysis.

43. Hendel, D.D. Test format and administration variables as related to the performance of mentally retarded adults on multi-factor tests of vocational abilities. *Proceedings, 79th Annual Convention of the American Psychological Association*, 1971, 615-616.

The present study was designed to test the hypothesis that modifications in test format and administration variables would improve the performance of mentally retarded adults on multi-factor ability tests such as the General Aptitude Test Battery (GATB). Two

studies were designed to investigate: 1) individual versus group administration and speeded versus non-speeded conditions; and 2) standard versus simplified instructions and standard versus simplified practice. Although a significant main effect resulted for speeded versus non-speeded conditions in all groups in study 1, higher means were obtained for the speeded conditions. The results implied that more radical procedural modifications in testing may be required for mentally retarded clients.

44. Gray, B.L. & Weiss, D.J. A pilot study of the measurement of job satisfaction of mentally retarded adults. *Proceedings, 79th Annual Convention of the American Psychological Association*, 1971, 611-612.

Initial phases of the development and validation of a job satisfaction questionnaire for mentally retarded adults were described. Items and directions for the Minnesota Satisfaction Questionnaire, a twenty item Likert format inventory, were revised. Verbal response categories were replaced by five faces showing different degrees of satisfaction. Retarded employees of a sheltered workshop completed the revised questionnaire, and the relationship between reported satisfaction and satisfaction as perceived by their counselors and supervisors was examined. Results of the pilot study indicated that the faces format can be used appropriately in measuring job satisfaction. Plans for additional research were outlined.

45. Whitely, S.E. Domain referenced testing: An alternative model for test construction. *Proceedings, 79th Annual Convention of the American Psychological Association*, 1971, 515-516.

The present paper noted that domain-referenced testing, interpreting scores with direct reference to the domain of item content, had been given increased attention. Weaknesses of the programmed learning approach and the achievement test approach include their inability to handle complex and heterogeneous domains. The author presented a modified version of Stephenson's structured Q-sample model as an alternative method of test construction. Advantages of the model were stated to include providing information concerning domain structure and not depending upon random sampling to estimate true scores.

46. Hendel, D.D. Vocational assessment of mentally retarded adults: Some unquestioned answers and unanswered questions. Paper presented at the 25th Annual Meeting of Region VIII American Association on Mental Deficiency, 1971. (Mimeographed)

The present paper outlined previous Work Adjustment Project research studies which were relevant to the current status of vocational rehabilitation for mentally retarded adults. The second part of the paper described the progress made by the Work Adjustment Project in devising tools for work personality assessment of retarded adults in three basic areas: 1) the modifications of present ability tests such as the General Aptitude Test Battery; 2) the revision of the Minnesota Importance Questionnaire to lower the reading level; and 3) the development of a pictorial form of the Minnesota Satisfaction Questionnaire. Implications of the studies for vocational rehabilitation counseling were outlined.

47. Elo, M.R. & Hendel, D.D. Classification as "mentally retarded": A determinant of vocational rehabilitation outcome? *Journal of Mental Deficiency*, 1972 (In Press).

The present study is an expanded version of a previous report (Number 26). Counseling outcomes for 2,827 non-retarded and 586 mentally retarded rehabilitation clients were compared on eighteen variables. The retarded were significantly different from the non-retarded in work status at closure, occupation at closure, weekly earnings at closure and length of time in various counseling status categories. Retarded clients were rehabilitated primarily into service occupations, earned less than non-retarded clients and spent a shorter time in counseling. The data contained in the study were suggested as the basis for a comparison of current outcomes with outcomes in a counseling framework based on more individualized assessment procedures.

Appendix C

Doctoral Dissertations related to Work Adjustment Project Research

1960

DeMann, M.M. Selected counselee characteristics predictive of successful case closure in vocational rehabilitation. Unpublished doctoral dissertation, University of Minnesota.

1963

Weiss, D.J. A technique for curvilinear multivariate prediction. Unpublished doctoral dissertation, University of Minnesota.

1964

Nelson, R. Factors related to preferences for contract agreements covering selected conditions of employment for a group of professional employees. Unpublished doctoral dissertation, University of Minnesota.

Shapiro, S. A study of the needs and satisfactions of social workers as perceived by college students and social workers. Unpublished doctoral dissertation, University of Minnesota.

1965

Carlson, R.E. An empirical evaluation of selected hypotheses from A Theory of Work Adjustment. Unpublished doctoral dissertation, University of Minnesota.

Dauw, D.C. Life experiences, vocational needs, and choices of original thinkers and good elaborators. Unpublished doctoral dissertation, University of Minnesota.

1966

Hamlin, M.M. Relationships between organizational climates of elementary schools and the degree of job satisfaction of teachers in the schools. Unpublished doctoral dissertation, University of Minnesota.

Kohlan, R.G. Relationships between inventoried interests and inventoried needs in a college sample. Unpublished doctoral dissertation, University of Minnesota.

1967

Olson, H. Relationships between certain personality characteristics of distributive education teacher coordinators and job satisfaction. Unpublished doctoral dissertation, University of Minnesota.

1968

Bates, G.L. The relationship of personality and work adjustment of vocational rehabilitants: A test of Holland's theory. Unpublished doctoral dissertation, University of Oklahoma.

Dressler, R.M. Relationships among needs, interests, and curricular choice in a sample of college men. Unpublished doctoral dissertation, University of Minnesota.

Golie, B.N. A study of the effects of an orientation treatment on new teacher perceptions of organizational climate and other selected variables. Unpublished doctoral dissertation, University of Minnesota.

Merrill, P.P. A study concerning the job satisfaction of elementary teachers and principals. Unpublished doctoral dissertation, University of Syracuse.

Salomone, P.R. Rehabilitation counselor job behavior and vocational personality: Needs and work style. Unpublished doctoral dissertation, University of Iowa.

1969

Anderson, L.M. Longitudinal changes in level of work adjustment. Unpublished doctoral dissertation, University of Minnesota.

Becvar, R.J. Job satisfaction of first-year teachers: A study of discrepancies between expectations and experiences. Unpublished doctoral dissertation, University of Minnesota.

Richardson, B.K. Prediction of rehabilitation counselor effectiveness: The relationship of counselor characteristics to supervisors' ratings. Unpublished doctoral dissertation, University of Iowa.

1970

Borgen, F.H. Taxonomic analysis of occupational environments: A comparison of two grouping methods. Unpublished doctoral dissertation, University of Minnesota.

Mace, R.E. Factors influencing the decisions of teachers to become administrators: A study of the differences in self-actualization and job satisfaction occurring between future administrators and career teachers. Unpublished doctoral dissertation, Syracuse University.

Rakich, J.S. Relationship between perceived job autonomy, job involvement, job satisfaction and job performance for hospital business office employees in the greater Detroit metropolitan area. Unpublished doctoral dissertation, University of Detroit.

1971

Betz, E.L. Occupational Reinforcer Patterns and need-reinforcer correspondence in the prediction of job satisfaction. Unpublished doctoral dissertation, University of Minnesota.

Byrnes, J.L. A study of certain relationships among perceived supervisory style, participativeness, and teacher job satisfaction. Unpublished doctoral dissertation, Syracuse University.

Desmond, R.E. A comparison of two measures of ability requirements. Unpublished doctoral dissertation, University of Minnesota.

Elo, M.R. The relationship of counselor and client needs to occupational outcomes. Unpublished doctoral dissertation, University of Minnesota.

Hershey, G.L. Experimental attributes and attitudinal postures of Indiana University academic secretaries. Unpublished doctoral dissertation, Indiana University.

Kauppi, D.R. The development of instrument-specific reading and comprehension pre-tests for standardized questionnaires and inventories. Unpublished doctoral dissertation, University of Minnesota.

MacTaggart, D.S. Job satisfaction and organizational openness as perceived by elementary teachers in a Florida school system. Unpublished doctoral dissertation, University of Miami.

Stone, G.V. The relationship between personality and work need-reinforcer correspondence. Unpublished doctoral dissertation, University of Minnesota.

Taylor, P. Job description and employee needs related to satisfaction and satisfactoriness of teachers. Unpublished doctoral dissertation, University of Connecticut.

Thorndike, R.M. Method of extraction, type of data, and adequacy of solutions in factor analysis. Unpublished doctoral dissertation, University of Minnesota.

Warren, L.W. The prediction of job satisfaction as a function of the correspondence between vocational needs and occupational reinforcers. Unpublished doctoral dissertation, University of Minnesota.

Willoughby, T.C. Needs, interests, reinforcer patterns and satisfaction of data processing personnel. Unpublished doctoral dissertation, University of Minnesota.

1972

Buchanan, J.C. The relationship between measured vocational needs and measured vocational abilities. Unpublished doctoral dissertation, University of Minnesota.

Fitzgerald, S. A career development study of elementary school teachers. Unpublished doctoral dissertation, University of Minnesota.

Hall, R.R. The relationship of selected moderator variables to rehabilitation outcomes. Unpublished doctoral dissertation, University of Minnesota.

Hendel, D.D. Paired comparisons: Inconsistency, intransitivity and compulsivity. Unpublished doctoral dissertation, University of Minnesota. (In progress)

Larouche, V. A multivariate investigation of biographical factors in job satisfaction. Unpublished doctoral dissertation, University of Minnesota.

Little, W.G. Relationships between certain personality characteristics of post-secondary distributive education personnel and job satisfaction. Unpublished doctoral dissertation, University of Minnesota.

- Soriano, L. A psychometric study of two response style variables in Employee Attitude Questionnaire surveys. Unpublished doctoral dissertation, University of Minnesota. (In progress)
- Steger, J.M. The relationship of selected variables to stability of vocational needs. Unpublished doctoral dissertation, University of Minnesota. (In progress)

Appendix D

Publications stemming from Work Adjustment Project Research

1960

- Carroll, S.J. The institutionalized population in Minnesota. *Public Health Reports*, 1960, 75, 823-826.
- Weiss, D.J. & Dawis, R.V. An objective validation of factual interview information. *Journal of Applied Psychology*, 1960, 44, 381-385.
- Schletzer, V.M. Labor market participation of physically handicapped persons in Minnesota. *Personnel and Guidance Journal*, September 1960, 6-10.

1961

- Herber, W.E. & Dawis, R.V. Referral information preferences of vocational rehabilitation counselors and ES placement personnel. *Personnel and Guidance Journal*, 1961, 39, 563-568.
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- Scott, T.B. & Stein, C.I. An index of ease or difficulty of rehabilitation. *Personnel and Guidance Journal*, 1961, 39, 352-354.

1962

- Banas, P.A. & Dawis, R.V. Identifying the physically handicapped through survey methods. *American Journal of Public Health*, 1962, 52, 443-449.

1964

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1966

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- Lofquist, L.H. The Minnesota Studies in Vocational Rehabilitation — implications for practice. *Studies in Rehabilitation Counselor Training*, 1967, 5, 48-58.

1968

- Betz, E.L., Weiss, D.J., Dawis, R.V., England, G.W. & Lofquist, L.H. The concept of work adjustment. In Zytowski, D.G. (Ed.), *Vocational Behavior*. New York: Holt, Rinehart and Winston, 1968, 443-449.
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- Golden, R.R., Weiss, D.J. & Dawis, R.V. An evaluation of Jaspens' approximation of the distribution functions of the F, t, and chi-square statistics. *Educational and Psychological Measurement*, 1968, 23, 163-165.

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1970

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- Desmond, R.E. & Weiss, D.J. Measurement of ability requirements of occupations. *Proceedings, 78th Annual Convention of the American Psychological Association*, 1970, 149-150.
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- 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.

Hendel, D.D. & Weiss, D.J. Individual inconsistency and reliability of measurement. *Educational and Psychological Measurement*, 1970, 30, 579-593.

Thorndike, R.M. & Weiss, D.J. Parsimony of factor analytic methods for diverse scientific areas. *Proceedings, 78th Annual Convention of the American Psychological Association*, 1970, 11-112.

Thorndike, R.M. & Weiss, D.J. Stability of canonical components. *Proceedings, 78th Annual Convention of the American Psychological Association*, 1970, 107-108.

*Zytowski, D.G. The concept of work values. *Vocational Guidance Quarterly*, 1970, 18, 176-186.

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Dawis, R.V. The Minnesota Studies in Vocational Rehabilitation. In Moses, H.A. and Patterson, C.H. (Eds.), *Readings in rehabilitation counseling*. Champaign, Illinois: Stipes, 1971.

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Gray, B.L. & Weiss, D.J. A pilot study of the measurement of job satisfaction of mentally retarded adults. *Proceedings, 79th Annual Convention of the American Psychological Association*, 1971, 611-612.

Hendel, D.D. Test format and administration variables as related to the performance of mentally retarded adults on multifactor tests of vocational abilities. *Proceedings, 79th Annual Convention of the American Psychological Association*, 1971, 615-616.

Tinsley, H.E.A. & Weiss, D.J. A multitrait-multimethod comparison of job reinforcer ratings of supervisors and supervisees. *Journal of Vocational Behavior*, 1971, 1, 287-299.

1972

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Taylor, K.E. & Weiss, D.J. Prediction of individual job termination from measured job satisfaction and biographical data. *Journal of Vocational Behavior*, 1972, 2, 123-132.

Weiss, D.J. The Minnesota Importance Questionnaire. In Zytowski, D. (Ed.), *Counseling with the new interest inventories*. Minneapolis: University of Minnesota Press, 1972.

*Asterisked items were not written by Work Adjustment Project staff members.

Appendix E

Computer Programs Developed by the Work Adjustment Project

ANOVA1

This program calculates a one-way analysis of variance with equal or unequal cell frequencies. An option is available to obtain Scheffe comparisons on all possible pairs of means.

ANOVA2

This program calculates the general least squares solution in a two-way analysis of variance, where both factors are of the fixed type.

CANVAL

This program calculates the product-moment correlation coefficient between weighted sums (variates) of two sets of variables. The program may be used also to cross-validate multiple correlations or canonical correlations.

COMDATA

This program analyses comparative judgment data of two types — multiple rank order data or complete pair comparison data. A variety of designs, with a maximum of 31 stimuli, can be analyzed.

COUNT

This program derives frequency distributions for a set of variables across a group of observations.

DELETER

This program deletes selected variables (rows and columns) from an input correlation matrix or pseudo-correlation matrix.

DISCRIM

This program calculates discriminant function analysis, Mahalanobis' D^2 , and centroid analysis for a maximum of 50 variables and 300 individuals.

ETA

This program calculates the correlation ratio (eta or curvilinear correlation) for degree of relationship between two variables and compares it with a measure of the linear relationship (product-moment correlation) between two variables.

FACSCOR

This program computes factor scores for a group of individuals on a set of factors.

GAIN

This program prints and punches, by individual, any or all of the following transformations of two variables — difference scores, sums, products, quotients and residual gains.

GATB

This program scores the item responses for the General Aptitude Test Battery. Aptitude scores for the nine aptitudes are compared to Occupational Aptitude Battery cutoffs. Results are presented in profile form for use by vocational counselors.

GATES

This program scores the item responses from the Gates Reading Survey and presents the results in profile form for use by vocational counselors.

IMAGE

This program computes the following types of factor analysis principal components, two communality solutions, image covariance analysis, and alpha factor analysis. An option is available to perform a varimax rotation of the resulting factor matrix.

MINRES

This program performs principal-axis and minimum residual factor analysis.

MIQ

This program scores the Minnesota Importance Questionnaire for the twenty vocational need dimensions and compares the resulting MIQ profile to the Occupational Reinforcer Patterns for 148 occupations. Results are presented on a five-page computer report for use by vocational counselors.

MMPI

This program scores the item responses from the Minnesota Multiphasic Personality Inventory and presents the results in profile form for use by vocational counselors.

RAINT

This program uses the method of reciprocal averages to derive integer weights for the categories of a set of categorical variables such that the internal consistency reliability coefficients for a set of measurements across the variables is maximized.

RAPRED

This program develops a multivariate prediction equation for a continuous dependent variable using any combination of continuous or categorical independent variables.

READIN

This program checks for card order errors and checks individual subject identification.

SCORING

This program scores scales on questionnaires or tests for which item responses have been punched for each individual according to his response choice for each item.

SUPCAN

This program computes bivariate, multiple and canonical correlations between two sets of variables for a maximum of 100 variables.

TESTAPE

This program prints out the first fifty unit records from each logical record on a disk or tape file.

TZSCORE

This program converts raw scores on a set of variables for a group of individuals to z-scores and/or T-scores..

UMLFA

This program computes Joreskog's approximation to Lawley's maximum likelihood factor analysis and can perform a varimax rotation of the resulting factor matrix.

Appendix F

Sample Pages of Instruments developed by the Work Adjustment Project

Do not write on this booklet

minnesota importance questionnaire

1967 Revision

Vocational Psychology Research

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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.

minnesota

job description questionnaire

Form S

Confidential

For Research Purposes Only

On the following pages you are asked to rank statements on the basis of how well they describe the job of:

Statements about this job are in groups of five. You are asked to consider *each group of five individually* and rank the five statements in terms of *how well they describe the job*, using the numbers "1" to "5." Then go to the next group of five statements and make the same kind of ranking.

For example, your answers on a group of statements might look like this:

Workers on this job . . .

- 4 get full credit for the work they do.
- 3 are of service to other people.
- 1 have freedom to use their own judgment.
- 5 do new and original things on their own.
- 2 have the chance to get ahead.

This means that, of the five statements, you consider "have freedom to use their own judgment" as most descriptive of the job; "have the chance to get ahead" as the next most descriptive statement; and so on.

You will find some of these comparisons more difficult to make than others, but it is important that you rank every statement in each group.

All information will be held in strictest confidence.

vocational psychology research
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Code Number

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Please rank the five statements in each group on the basis of how well they describe the job mentioned on the front page. Write a "1" by the statement which best describes the job; write a "2" by the statement which provides the next best description; continue ranking all five statements, using a "5" for the statement which describes the job least well.

Workers on this job . . .

- _____ are busy all the time.
 - _____ have work where they do things for other people.
 - _____ try out their own ideas.
 - _____ are paid well in comparison with other workers.
 - _____ have opportunities for advancement.
-

Workers on this job . . .

- _____ have work where they do things for other people.
 - _____ have something different to do every day.
 - _____ get a feeling of accomplishment.
 - _____ have bosses who train their men well.
 - _____ have a company which administers its policies fairly.
-

Workers on this job . . .

- _____ do work without feeling that it is morally wrong.
 - _____ have bosses who back up their men (with top management).
 - _____ have something different to do every day.
 - _____ make use of their individual abilities.
 - _____ are busy all the time.
-

Workers on this job . . .

- _____ have a company which administers its policies fairly.
 - _____ try out their own ideas.
 - _____ make use of their individual abilities.
 - _____ have co-workers who are easy to make friends with.
 - _____ have the position of "somebody" in the community.
-

minnesota satisfaction questionnaire

1967 Revision



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Ask yourself: How **satisfied** am I with this aspect of my job?

- 1 means I am **not satisfied** (this aspect of my job is much poorer than I would like it to be).
 2 means I am **only slightly satisfied** (this aspect of my job is not quite what I would like it to be).
 3 means I am **satisfied** (this aspect of my job is what I would like it to be).
 4 means I am **very satisfied** (this aspect of my job is even better than I expected it to be).
 5 means I am **extremely satisfied** (this aspect of my job is much better than I hoped it could be).

On my present job, this is how I feel about . . .		For each statement circle a number.				
1. The chance to be of service to others.	1	2	3	4	5	
2. The chance to try out some of my own ideas.	1	2	3	4	5	
3. Being able to do the job without feeling it is morally wrong.	1	2	3	4	5	
4. The chance to work by myself.	1	2	3	4	5	
5. The variety in my work.	1	2	3	4	5	
6. The chance to have other workers look to me for direction.	1	2	3	4	5	
7. The chance to do the kind of work that I do best.	1	2	3	4	5	
8. The social position in the community that goes with the job.	1	2	3	4	5	
9. The policies and practices toward employees of this company.	1	2	3	4	5	
10. The way my supervisor and I understand each other.	1	2	3	4	5	
11. My job security.	1	2	3	4	5	
12. The amount of pay for the work I do.	1	2	3	4	5	
13. The working conditions (heating, lighting, ventilation, etc.) on this job.	1	2	3	4	5	
14. The opportunities for advancement on this job.	1	2	3	4	5	
15. The technical "know-how" of my supervisor.	1	2	3	4	5	
16. The spirit of cooperation among my co-workers.	1	2	3	4	5	
17. The chance to be responsible for planning my work.	1	2	3	4	5	
18. The way I am noticed when I do a good job.	1	2	3	4	5	
19. Being able to see the results of the work I do.	1	2	3	4	5	
20. The chance to be active much of the time.	1	2	3	4	5	
21. The chance to be of service to people.	1	2	3	4	5	
22. The chance to do new and original things on my own.	1	2	3	4	5	
23. Being able to do things that don't go against my religious beliefs.	1	2	3	4	5	
24. The chance to work alone on the job.	1	2	3	4	5	
25. The chance to do different things from time to time.	1	2	3	4	5	

**minnesota
satisfactoriness
scales**



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APPLICATIONS OF THEORY OF WORK ADJUSTMENT TO REHABILITATION & COUNSELING

Employee Name _____ Job _____

Rated by _____ Date _____

Please check the best answer for each question

Be sure to answer all questions

<i>Compared to others in his work group, how well does he . . .</i>	<i>not as well</i>	<i>about the same</i>	<i>better</i>
1. Follow company policies and practices?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Accept the direction of his supervisor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Follow standard work rules and procedures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Accept the responsibility of his job?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Adapt to changes in procedures or methods?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Respect the authority of his supervisor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Work as a member of a team?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Get along with his supervisors?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Perform repetitive tasks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Get along with his co-workers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Perform tasks requiring variety and change in methods?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<i>Compared to others in his work group . . .</i>	<i>not as good</i>	<i>about the same</i>	<i>better</i>
12. How good is the quality of his work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. How good is the quantity of his work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<i>If you could make the decision, would you . . .</i>	<i>yes</i>	<i>not sure</i>	<i>no</i>
14. Give him a pay raise?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Transfer him to a job at a higher level?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Promote him to a position of more responsibility?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>