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AUTHOR Mann, Walter G., Jr.
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ABSTRACT

This report demonstrates the feasibility of covering a large number of classes in a single study that has both classification and selection applications. A job analysis of clerical and administrative positions in the Government of the U.S. Virgin Islands was accomplished by means of a single questionnaire comprised of 264 items of the following types: 31 knowledge, 104 skill or ability, 99 activity, 15 job evaluation, and 15 biographical. A quantitative procedure utilizing activity data was developed to assure that positions are properly assigned to classes. Factor analysis of skill and ability ratings identified seven job domains that can be readily operationalized in the form of written or performance tests. The inferential leap from job analysis data to test content was minimized by including statements of test behavior in the questionnaire; moreover, the validity of subject-matter-expert ratings of skills and abilities was demonstrated by correlating them with time-spent ratings of work activities. A factor analysis of 15 job evaluation scales produced 2 factors (Scope and Complexity) that can be used to predict the grades of these types of positions. Selection and classification recommendations for the Virgin Islands and potential usefulness of the methodology for other jurisdictions are discussed. (Author)

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A Multipurpose Analysis of Clerical and Administrative Positions in the U.S. Virgin Islands



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A MULTIPURPOSE ANALYSIS OF
CLERICAL AND ADMINISTRATIVE POSITIONS
IN THE U.S. VIRGIN ISLANDS

Walter G. Mann, Jr.

U.S. Office of Personnel Management
Personnel Research and Development Center
State and Local Branch
Washington, D.C.
September 1980

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ABSTRACT

This report demonstrates the feasibility of covering a large number of classes in a single study that has both classification and selection applications. A job analysis of clerical and administrative positions in the Government of the U.S. Virgin Islands (V.I.) was accomplished by means of a single questionnaire comprised of 264 items of the following types: 31 knowledge, 104 skill or ability, 99 activity, 15 job evaluation, and 15 biographical. A quantitative procedure utilizing activity data was developed to assure that positions are properly assigned to classes. Factor analysis of skill and ability ratings identified seven job domains that can be readily operationalized in the form of written or performance tests. The inferential leap from job analysis data to test content was minimized by including statements of test behavior in the questionnaire; moreover, the validity of subject-matter-expert ratings of skills and abilities was demonstrated by correlating them with time-spent ratings of work activities. A factor analysis of 15 job evaluation scales produced two factors (Scope and Complexity) that can be used to predict the grades of these types of positions. Selection and classification recommendations for the Virgin Islands and potential usefulness of the methodology for other jurisdictions are discussed.

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A MULTIPURPOSE ANALYSIS OF CLERICAL AND ADMINISTRATIVE POSITIONS IN THE U.S. VIRGIN ISLANDS

Purpose

In December of 1976 the Personnel Office of the U.S. Virgin Islands (V.I.) initiated a job analysis of clerical and administrative positions for the purposes of (a) identifying and defining important skill and ability domains that can be measured by tests, (b) developing a quantitative procedure for assigning positions to classes, and (c) developing a quantitative procedure for assigning grades to classes of positions. It was intended that the study generate information about clerical and administrative classes which would assist V.I. in the development of selection instruments and classification procedures. Although different purposes were served by different information gathered at the same time, one of the unique features of the study is the interplay of the various types of data.

This study was also intended as a demonstration of:

- the cost and time effectiveness of applying job analysis procedures simultaneously to multiple classifications and agencies;
- the usefulness of multivariate statistics such as discriminant, regression, and factor analyses; and
- the value of a single job analysis questionnaire for both selection and classification purposes.

Domain of Jobs

Eleven government agencies operating under the same classification system participated in the present job analysis: Consumer Services Administration, Law Enforcement Protection Agency, Office of Highway Safety, Personnel Office, and the Departments of Education, Finance, Health, Labor, Public Safety, Public Works, and Social Welfare. Each agency was asked to administer the questionnaire to full-time clerical and administrative employees, GS-1 to 24. Information concerning 78 classes was collected (see Table 1).

The approach used in this study to define a population first identifies a fairly broad job family (in this case, GS-1 to 24, Clerical and Administrative). After the data are collected, the population is defined quantitatively in terms of work activities. This approach has several advantages over the typical approach:

- It produces a larger sample. (This is important for classes having few incumbents.)
- It allows for making comparisons between classes, including testing the hypothesis that all the positions in a class are correctly classified.
- It provides a time-efficient, cost-effective means for studying a large number of classes simultaneously.

TABLE 1

Number of Positions in Study By Classification

Position Classification	Number of Positions in Study
Accountant I	5
Accountant II	1
Accountant III	3
Accounting Supply Analyst	1
Administrator	1
Administrative Officer I	5
Administrative Officer II	6
Administrative Officer III	5
Administrative Secretary I	12
Administrative Secretary II	12
Alcohol Control Inspector	1
Assistant Coordinator	1
Assistant Departmental Personnel Officer	1
Assistant Superintendent, Plant	1
Auditor Technician	1
Bookkeeper III	4
Bookkeeping Machine Operator	2
Chauffeur	1
Chief Dietician	1
Chief Inspector	1
Chief Payroll Audit Clerk	1
Chief Pharmacologist	1
Chief, Records & Communication	1
Claims Adjustor I	2
Claims Adjustor II	1
Clerk III	2
Clerk Stenographer	1
Clerk Typist I	1
Clerk Typist II	6
Clerk Typist III	11
Collection Clerk	1
Communication Technician	1
Department Personnel Officer	1
Director	3
Enforcement Officer I	4
Fiscal Officer	1
Food Service Superintendent	1
Internal Investigative Agent	1
Junior Auditor	6
Junior Management Assistant	3
Junior Tax Records Clerk	1
Keypunch Operator I	1
Legal Assistant	1
Legal Secretary I	1
Legal Secretary II	1
Loan Application Clerk	1
Medical Secretary	1
Messenger	2
Metrologist	1
Keypunch Operator II	1

(Continued)

TABLE 1 (Continued)

Position Classification	Number of Positions in Study
Payroll Audit Clerk I	1
Payroll Audit Clerk II	1
PBX Operator	1
Personnel Clerk I	1
Personnel Records Clerk II	1
Project Coordinator, PAL	1
Property and Procurement Officer I	1
Public Information & Education Officer	1
Receptionist	1
Research Analyst I	1
Revenue Audit Clerk II	1
Sanitarian II	1
Senior Auditor	1
Senior Auditor Clerk	1
Senior Management Analyst	1
Statistical Clerk II	3
Superintendent, SW	1
Superintendent, Plant Operations	1
Superintendent, Correctional Treatment	1
Tax Accountant & Recording Clerk	1
Tax Accountant & Recording Clerk I	1
Tax Accountant & Recording Clerk II	1
Tax Return Examiner I	1
Teller (Collections) IV	1
Vouchering Clerk I	1
Voucher Examiner II	4
Voucher Examiner III	2
Voucher Examiner IV	2

Clerical and administrative classes were chosen for the present study primarily because of the relatively large number of employees in these classes, which in turn is related to such things as the number of subjects available for job analysis (the statistical procedures utilized require large samples and cross-validation), the number of vacancies, and the number of subjects available for a criterion-related validity study (if undertaken). Other considerations favoring the choice of clerical classes included the availability of test items in V.I. and elsewhere likely to be found appropriate (which would obviate the need for expensive and lengthy test development) and the quality of job analysis materials available (which would obviate the need for expensive and lengthy development of a job analysis questionnaire). A final consideration concerned the appropriateness of content validation, which is important because criterion-related validation will be infeasible for most, if not all, of these classes. Tests for entry-level clerical positions are possibly more amenable to content validation than are the tests for other entry-level positions.

Review of the Literature

The review of the literature was directed primarily towards extracting relevant statements from the many different sources available.

Selection of documents to be reviewed was according to two touchstones: comprehensive (did the particular document add anything, vis-a-vis other documents already selected?) and current (clerical and administrative jobs have changed appreciably over the last 20 years). Statements were drawn from documents when they were judged to be (a) independent from one another, (b) understandable to both psychometricians and incumbents, (c) behaviorally oriented and (d) comprehensive in coverage of specific domains. Statements describing the skill or ability aspect of work behaviors were drawn from the following documents: Fleishman (1972), Kane (1973), Kintop & Mussio (1974), Manpower Administration (1973), McClelland (Note 1), and Page (1975). Additional skill and ability statements were written to describe item types described by Dailey and Shaycoft (1961) and Psychological Corporation (1976). These targeted skills and abilities will later be referred to as "promising item types."

Activity or task statements were drawn from Manpower Administration, McClelland, and Page. Job evaluation statements were drawn from the USCSC factor-ranking, benchmark system (Anderson and Corts, 1973). Anderson and Corts ordered their statements into nine subfactors found important in civilian and military agencies. (These subfactors incidentally are not the result of factor analysis but only rubrics given to job requirements.) Of the nine subfactors, eight were used in the present study; Personal Contacts was dropped because it was judged, for clerical and administrative personnel, to be identical to Purpose of Personal Contacts (which was retained). Five of the eight subfactors were measured by more than one scale, because sufficient items were available and this would tend to enhance reliability.

Overview

A major objective of the study was to develop a quantitative procedure for assigning positions to classes. This procedure was used to assess the validity of the current classification of V.I. clerical and administrative positions. The quantitative procedure compares the differences between classes, in terms of time spent on work activities, to the differences within classes. Some overlap of work activities between classes is to be expected, but when the activities performed in a position more closely resemble the activities done in positions in other classes, the credibility of the classifications must be questioned. If the current classifications are not valid, the information concerning skills and abilities for particular classes will suffer.

Another objective was to develop a quantitative procedure for assigning an appropriate grade for a position or class of positions, based on 15 scales purporting to measure eight job factors: Complexity, Scope and Effect, Knowledge and Skill Required by the Job, Guidelines, Work Environment, Physical Requirements, Supervisory Controls, and Purpose of Personal Contacts.

A third objective of the study was to identify skills and abilities, measures of which could legitimately be used to screen or rank applicants. A written test measuring a skill or ability may be content valid if it is operationally defined in terms of observable aspects of work behaviors. Skill and ability statements were written in behavioral terms, and some of these statements described test content, so that there was a direct link (i.e., no inferential leaps) between test and job. Incumbents whose classifications had been validated rated skills and abilities in terms of (a) whether they were needed for barely acceptable performance and

(b) their importance for differentiating satisfactory from superior workers. This information was then used to specify item types for screening and ranking applicants for particular classes.

A supplementary research objective of the present study was to test the assumption that incumbents can validly make the types of importance ratings described immediately above. Typically, the judgments of a subject matter expert (SME) are accepted at face value and are not subjected to verification. Since there are limits to judgmental capacities, it is reasonable in a job analysis study based on judgments to collect evidence to substantiate a subject's ability. Concurrent validation was undertaken by correlating criticality/importance ratings for each of the 104 skills and abilities with the time spent ratings for the 99 activities. The use of time spent ratings as the criterion is based on research that incumbents can validly rate work activities for amount of time spent (Cristal, Note 2). The basic evidence for the validity of the criticality/importance ratings would come from a sufficient number of significant correlations. The degree of correlation is not important, because it is not assumed that there is a one-to-one relationship between the importance of a skill or ability and time spent on relevant job activities. Furthermore, it should not be expected that the importance of each skill or ability should correlate with the time spent on each activity. There should be a significant correlation only when the activity is relevant to the skill or ability. For example, activities such as drafting letters, memos, and reports are logically related to proper grammar and punctuation. On the other hand, an activity such as supervising white-collar employees is not logically related to ability to type 40 WPM.

METHOD

Questionnaire

The Job Analysis Questionnaire (see Appendix A) contains 24 pages divided into five major parts: background information (15 items), knowledges (31), skills and abilities (104), job evaluation scales (15), and activities (99). The items in the Questionnaire were taken from other questionnaires that had recently been developed. This pool of items was reviewed by two personnel psychologists to determine whether it was appropriate for V.I. in terms of comprehensiveness of coverage and understandability by subjects. The Questionnaire was pretested in two agencies, the Department of Health and the Personnel Office. As part of the pretest, subjects were instructed to suggest additional items for the Questionnaire. On the basis of the pretest, the Questionnaire underwent extensive revision, especially with regard to instructions.

The background section contains questions that could be used to identify the sample or interpret the results, e.g., agency, length of experience, education level, year of birth, sex, and class title.

The next section of the Questionnaire contains various knowledge statements that were considered to have potential as selective placement factors for clerical or administrative positions. Each statement was rated on a four-point scale developed by the author: "No Knowledge Required," "Conversant Knowledge of Terms," "Journeyman Knowledge of Procedures," and "Mastery of Principles and Procedures." No attempt was made to analyze the data generated by this scale, because at least one-fourth of the respondents did not appear to understand the scale. For example, one secretary indicated that her position required a mastery of principles and procedures of real estate.

The section on skills and abilities includes statements referring to behaviors easily measurable by a test (e.g., "Ability to understand words commonly used in office memos"), as well as other behaviors needed to define the job domain (e.g., "Ability to write in a clear, well-organized, and complete style"). Coverage was given not only to the type of behavior but also to the skill level. Two scales were used. The first, "Needed for barely acceptable performance," was designed to identify abilities or skills needed for screening applicants. The second, "Important for superior performance," was designed to identify abilities or skills important for ranking applicants.

The 15 job evaluation scales were designed to measure eight job factors: Scope and Effect, Complexity, Knowledge and Skill Required by the Job, Guidelines, Work Environment, Physical Requirements, Supervisory Controls, and Purpose of Personal Contacts. Each scale had from three to five statements. Incumbents checked the one statement in each scale that best described their respective positions.

Each of the 99 work activity statements was rated on a six-point scale, ranging from "None; I never do this" to "More than 4 hours per day." These activity statements (e.g., "Takes the proceedings of hearings or meetings with a steno machine") are, in the opinion of the author, between task and duty statements in terms of specificity.

Procedure

The heads of all V.I. government agencies were sent letters requesting their participation in the study and asking them to name a project coordinator (see Appendix B). Coordinators were asked to determine the number of full-time clerical and administrative personnel, GS-1 and 24, in their agencies. Sufficient questionnaires were printed and delivered to each coordinator, along with instructions for administering. (These instructions and the letter to the agency are printed in Appendix A.) The questionnaire could be completed anonymously, if the incumbent so desired.

The population was limited to full-time clerical and administrative employees in General Schedule grades 1 through 24 who had been in their jobs more than three months, and who worked in one of the 11 agencies that participated in the study. GS-24 was selected as the top grade because beyond this, to the limit of GS-30, are higher level professionals and managers. The General Schedule was chosen because it excluded those not of interest in the present study, such as blue-collar workers, police officers, firefighters, nurses, doctors, and teachers.

Sample

The sample consisted of 160 clerical and administrative employees, representing 78 classes and 11 agencies. The individuals in the sample had been with the government anywhere from 3 months to 31 years (mean = 8 1/2 years), ranged from 18 to 60 years of age (mean = 36), had been in class from 3 months to 20 years (median = 4 years), ranged from GS-1 to 24 (median = 15), and had supervisors who ranged from GS-15 to 30 (median = 24). Fifty-six percent judged a high school diploma to be necessary to perform the duties of their job in a satisfactory manner, while forty-two percent thought higher education was called for. In this sample 77% were female, 96% had a high school diploma, and 13% had completed at least four years of college. In addition, 22% of the incumbents considered themselves journeymen, 8% master craftsmen, 18% lead workers, and 25% supervisors.

Accurate population data were not available. Therefore, no comparison of sample and population data was attempted. The sample did not appear to be unrepresentative of clerical and administrative personnel in V.I.

Analysis

To determine the extent to which the current classification of positions is valid, the work activity data were factor analyzed (to reduce the number of activities to a reasonable number) and then subjected to a multiple discriminant analysis, with position class as the grouping variable.

To establish a procedure for assigning an appropriate grade to a position or class of positions, the 15 job evaluation scales were factor analyzed (to reduce them to a smaller number and to test the hypothesis of Anderson and Corts that they measure 5 job factors). The resultant factor scores were then used to predict grade by means of multiple regression analysis.

To identify skills and abilities, measures of which could appropriately be used to screen or rank applicants, two steps were taken. The importance data were factor analyzed, in order to delineate clusters of abilities. Within each cluster those skills and abilities rated important or critical by at least 50% of the SME's were used to identify item types.

To test the assumption that incumbents can in fact make the type of judgments that underlie the importance ratings of skills and abilities, those ratings were correlated with the time spent ratings for work activities.

RESULTS

Classification Applications

Work Activity Dimensions

The time-spent ratings on the 99 activities are basic to the study. They explicate the type of work done and serve to support or enhance other data analyses. In addition, grouping activities (by factor analyzing the time-spent data) produces more meaningful and reliable results.

Twenty principal component factors were extracted from the intercorrelations of the time-spent ratings for the 160 subjects and subjected to orthogonal varimax rotation. These 20 factors accounted for 70% of the variance among the 99 scales, with none of the factors accounting for more than 10% nor less than 2%. Information concerning the factor analysis is in Appendix C.

The author named Factor I General Administration. It contains 16 activities with a loading of at least .5. Two activities loaded .7 or greater on this factor: "Plans and organizes office practices and procedures" and "Advises high-level decisionmakers."

Factor II was named General Clerical. It contains 12 activities with a loading of at least .5. Three activities loaded .7 or greater on this factor: "Types letters and reports according to standard procedures," "Types information on forms," and "Arranges for appointments, events, meetings, or travel arrangements."

Factor III was named Auditing. It contains seven activities with a loading of at least .5. Four activities loaded .7 or greater on this factor, the two highest being: "Makes budget estimates" and "Periodically reviews expenditures to help keep the organization within limitations."

Factor IV was named Inventory and Stockkeeping. It contains five activities with a loading of at least .5. Two activities loaded .7 or greater on this factor: "Investigates availability of equipment and approves cost estimates of equipment" and "Contracts for sale, purchase, and delivery of goods or services."

Factor V was named Mailing. It contains six activities with a loading of at least .5. Only one activity loaded .7 or greater on this factor: "Folds paper or stuffs envelopes by hand."

Factor VI was named Bookkeeping. It contains four activities with a loading of .7 or greater, the two highest being: "Operates machine to copy and post data, make computations, and compile records" and "Operates machine to proof transactions and keeps qualitative records accounts."

Factor VII was named Inspection. It contains four activities with loadings of .5 or greater. Two activities loaded .7 or greater: "Conducts investigations to determine compliance with laws or regulations" and "Inspects establishments with respect to compliance with laws."

The remaining factors had only one to three activities that loaded .5 or greater. The labels of those factors that could be named are listed in Table 2, column one, along with the above factors. The names of factors from other studies are listed in the next four columns.

TABLE 2

Comparison of Factors Obtained in Five Studies of Clerical Work

Virgin Islands	Page (1975)	Prien (1965)	Thomas (1952)	Chalupsky (1962)
I. General Administration	4. Supervision 8. Coordinating	2. Supervision 9. Executive Secretarial Assistance	IV. Planning and Supervision	B. Supervision
II. General Clerical	1. General Typing 7. Filing 11. Receptionist 12. Typing Stencils	1. Typing 4. Filing 12. Receptionist	I. Typing VII. Routine Clerical V. Filing	E. Typing and General Clerical
III. Auditing				
IV. Inventory and Stockkeeping	3. Maintaining Inventory		VI. Stock Handling	A. Inventory and Book-Keeping
V. Mailing	13. Mailing	10. Mailing		

(Continued)

TABLE 2 (Continued)

Comparison of Factors Obtained in Five Studies of Clerical Work

Virgin Islands	Page (1975)	Prien (1965)	Thomas (1952)	Chalupsky (1962)
VI. Bookkeeping	2. Numerical Computation 9. Bookkeeping and Billing	3. Bookkeeping and Clerical Accounting 8. Manpower Records Maintenance	II. Listing and Com- piling VIII. Calculation	C. Computation and Book- Keeping
VII. Inspection				
VIII. Training				
IX. Data Analysis		6. Analysis and Reporting of Business Data		
X. Language Translation				
XI. Chart Making				
XII. Material Weighing				
XIII. Operating EDP Equipment	14. Key punching	5. Operation of Data Process- ing Equipment		
XIV. Cashiering	6. Cashiering	7. Cash Operating Accounts		
XV. Claims Adjusting				
XVI. Public Relations		11. Communica- tions and Public Relations	III. Communica- tion	D. Communica- tions and Public Relations
XVIII. Steno	5. Taking and Typing Stenotype Notes 10. Taking and Typing Shorthand Notes			

Validity of Current Classifications

To determine whether sufficient overlap among current classes might exist so as to warrant combining two or more of them, multiple discriminant analysis (Rulon, 1951) was undertaken. To reduce chance error, only those classes that had at least three positions with complete data were used. This left 80 positions and 12 classes, with a median of 5 positions per class.

The data from this study most relevant to classification are time-spent ratings for activities. To reduce chance errors among the 99 activities, it was decided to use factor scores based on the time-spent ratings to classify positions. Since 20 factors had been derived from the 99 time-spent ratings, there were 20 factor scores per position.

The multiple discriminant analysis (MDA) comprised the following steps:

- (1) A discriminant function was computed for each of the 12 classes. Each discriminant function is a set of 20 weights (one for each of the factor scores). The function gave the greatest weight to those factors that had the highest ratio of interclass differences relative to intraclass differences. Least weight was given to those activity factors where the ratio of interclass differences to intraclass differences was smallest.
- (2) Using these discriminant functions, 12 scores (one for each class) were computed for each position. The higher the score for a position, the closer the activity profile of that position resembles the activity profile for a specific class.
- (3) Using the scores developed in (2), positions were assigned to the class that they most closely resembled. Thus, the activity profile of each Administrative Officer II position was statistically compared with the profiles for each of the 12 classes and assigned to the class it most closely resembled. If it was assigned to its original class, that is evidence that the position is correctly classified. If it was assigned to some other class, that is evidence of misclassification.

MDA assigned 69% of the positions to their original classes. By visual inspection, errors (i.e., discrepancies) in classification were randomly distributed in terms of grade: some misclassifications were at a higher grade and some were lower. In Table 3, it may be seen, for example, that of the 12 Administrative Secretaries I, MDA assigned 9 to their original class, 2 to lower classes (Clerk-Typist), and 1 to a higher class (Administrative Officer I). Referring to Table 3 again, it may be seen that of the six Administrative Officers II, MDA assigned 5 to their original class and one to a lower class (Clerk-Typist I). In no case was an absurd assignment noted; e.g., an Administrative Secretary assigned to the class of Statistical Clerk.

The distribution of discriminant function scores for a class can be used to estimate the probability that a specific position belongs to that class. The probability that each position was correctly assigned was ascertained. By and large, probabilities were high that positions were correctly assigned; e.g., for the 12 Administrative Secretaries I, the median probability that they belonged in that class was .72; for the six Administrative Officers II, the median probability was .84.

TABLE 3

Current Classification of Positions Compared to
Classification of Positions According to Multiple Discriminant Analysis (MDA)

Current Class	Number of Positions Assigned to 12 Classes by MDA												Total Current N
	A	B	C	D	E	F	G	H	I	J	K	L	
A. Accountant I	5	0	0	0	0	0	0	0	0	0	0	0	5
B. Administrative Officer I	0	3	0	0	0	1	0	0	1	0	0	0	5
C. Administrative Officer II	0	0	5	0	0	0	0	1	0	0	0	0	6
D. Administrative Officer III	0	0	0	3	1	0	0	0	0	0	0	1	5
E. Administrative Secretary I	0	1	0	0	9	0	0	1	1	0	0	0	12
F. Administrative Secretary II	0	2	0	0	2	6	0	1	1	0	0	0	12
G. Bookkeeper III	2	0	0	0	0	0	2	0	0	0	0	0	4
H. Clerk Typist II	0	0	0	0	0	0	0	4	1	0	0	0	5
I. Clerk Typist III	0	1	1	0	1	0	0	2	8	0	0	0	13
J. Enforcement Officer I	0	0	0	0	0	0	0	0	0	4	0	0	4
K. Junior Auditor	0	0	2	0	0	0	0	0	0	0	4	0	6
L. Statistical Clerk II	0	0	1	0	0	0	0	0	0	0	0	2	3
Total Assigned N	7	7	9	3	13	7	2	9	12	4	4	3	80

Note. Rows are the current classes. Columns are the classes to which positions are assigned based on the multiple discriminant analysis. The diagonal contains the number of current positions assigned by MDA to their current classification.

The hypothesis that the group means on the 20 factor scores differ was tested by the Mahalanobis (1936) D square. With 220 degrees of freedom the Generalized Mahalanobis D square was 817.43. Interpreted as a chi square, this D square value indicates a probability of less than .01 that group mean differences on the 20 factor scores of this magnitude could have occurred if the null hypothesis were true.

Part of the discriminant analysis is the identification of the activity factors that most effectively discriminated among classes. Table 4 lists the univariate and multivariate F values for each of the 20 activity factors. The univariate F for a factor is the result of a simple one-way analysis of variance. A multivariate F is the "F to remove" in the stepwise discriminant program. It is the result of a likelihood ratio test of the equality of the conditional distribution of a factor, given the other factors. The lower a multivariate F, the less the loss in discriminating power if that factor were dropped from the analysis. Univariate degrees of freedom were 11 and 68; multivariate degrees of freedom, 11 and 49.

A closer look should be directed at those factors that have a multivariate probability less than .01 (I, II, VI, and VII) and those that have a multivariate probability greater than .70 (IV, XI, XVI, and XVIII). The former are the most efficient discriminators: General Administration, General Clerical, Bookkeeping, and Inspection. The latter factors have the least discriminatory power: Inventory and Stockkeeping, Chart Making, Public Relations, and Steno. As expected, the more general factors were the best overall discriminators and those important for only one or two classes (such as Steno) least discriminating.

TABLE 4
Discriminatory Indices of 20 Activity Factors

Factor ^a	Univariate F	Univariate Probability	Multivariate F	Multivariate Probability
I	4.13	0.0001	2.97	0.0044
II	5.66	0.0000	4.91	0.0000
III	2.38	0.0146	2.48	0.0148
IV	0.78	0.6588	0.31	0.9795
V	1.24	0.2801	1.09	0.3924
VI	9.99	0.0000	8.62	0.0000
VII	4.38	0.0001	5.28	0.0000
VIII	0.60	0.8237	0.80	0.6439
IX	1.41	0.1870	1.20	0.3096
X	2.50	0.0105	1.76	0.0872
XI	0.72	0.7186	0.61	0.8085
XII	3.07	0.0021	2.31	0.0223
XIII	0.94	0.5053	1.30	0.2511
XIV	1.49	0.1563	0.81	0.6346
XV	1.19	0.3112	1.24	0.2844
XVI	0.57	0.8445	0.73	0.7037
XVII	0.81	0.6257	0.75	0.6879
XVIII	0.72	0.7126	0.67	0.7636
XIX	1.60	0.1196	1.71	0.0995
XX	0.99	0.4659	1.06	0.4116

^aSee Table 2 for labels of these factors.

Job Evaluation Dimensions

By means of factor analysis, an attempt was made to reduce the 15 job evaluation scales to a few meaningful factors. Anderson & Corts (1973) had hypothesized five such factors, but provided no data to either confirm or deny. While this study does not support the hypothesis that five dimensions adequately explain the 15 job evaluation scales, it does suggest reasonable alternative hypotheses.

From the intercorrelations of the scores on the 15 job evaluation scales, three principal component factors were extracted and rotated orthogonally. These three factors accounted for 55% of the common variance (see Appendix D for factor information). The first factor (accounting for 27% of the common variance) had nine scales that loaded .5 or better: Scope (2), Supervisory Controls (3), Guidelines (2), Purpose of Personal Contacts, and Knowledge Required by the Job. This factor was called Scope, because all the above-named scales, in one way or another, define the scope of a position. This is fairly obvious in the case of the seven scales intended to measure Scope, Guidelines, and Supervisory Controls. Purpose of Personal Contacts is logically related to Scope, because the greater the scope of one's position, the more diverse and the higher the level of one's contacts. Knowledge Required by the Job is also logically related to Scope, because the more knowledge required by the position, the greater tends to be the latitude given the incumbent. Thus, these nine scales, representing four hypothetical factors (according to Anderson and Corts), collapsed on the first factor.

The second factor accounted for 16% of the common variance. Having only the Complexity scales loading .6 or higher, it was called Complexity. In the Anderson and Corts hypothetical framework, Complexity is only a sub-factor.

The third factor accounted for 12% of the common variance. It had three scales loading .5 or higher: Physical Requirements, Work Environment, and Skill Required by the Job (negative loading). These three scales were intended by Anderson and Corts to measure three separate subfactors, but in this study they have collapsed on a single factor named Unskilled Labor.

Prediction of Grade

Step-wise multiple regression analysis was used to determine the extent grade could be predicted from the data at hand. Three different types of predictors were used, the first type being the activity scales. The ratings on these scales were reduced, as described previously, to 20 factor scores. In the step-wise multiple regression analysis, the factor score with the highest correlation with grade is first identified. Then other factor scores are used in combination with the best predictor if they increase the precision with which grade is estimated. In all, 15 of the 20 activity factor scores were used in the prediction of grade. The multiple correlation was .74, which was statistically significant at the .001 level. The five best predictors of grade were General Administration ($r = +.43$), Mailing ($r = -.23$), Data Analysis ($r = +.22$), Auditing ($r = +.21$), and General Clerical ($r = -.19$), which in combination correlated .61 with grade.

Next, the job evaluation factors were used to predict grade. Of these three factors only the first two were accepted by the step-wise multiple regression. The first job evaluation factor (Scope) correlated .55 with grade; the second (Complexity), .36. Together they correlated .65 with grade (significant at the .001 level).

Thus, both the job evaluation factors ($R = .65$) and the activity factors ($R = .74$) did a good job of predicting the grades of positions. While the activity factors provided a significantly better prediction of grade for this sample than did the job evaluation scales (.05 level), it took more of the former (15) than the latter (2). When the two best activity factors were combined to predict grade, the multiple correlation was only .49.

One other piece of information was also correlated with grade: the incumbent's rating of the level of education necessary to perform the duties of the job in a satisfactory fashion ($r = .64$). Thus, this easily available piece of information did just as well as the two job evaluation factors at predicting incumbents' grades. When a step-wise multiple regression was performed, using the two job evaluation factors and level of education needed, the resultant R with grade was .73.

Selection Applications

Validation of Ratings of Skills and Abilities

The behavioral data used to develop selection tests were collected by having SME's rate statements describing skills and abilities for criticality/importance. These ratings were correlated with time spent ratings of

99 activities. Some skills and abilities were excluded from the analysis, because they did not represent promising item types¹, SME's judged them unimportant, or they correlated highly with more important abilities. Sixteen percent of the correlations were significant at the .01 level of statistical significance, far beyond the point to be expected on a purely chance basis.

Important Job Behavior Dimensions

The ratings of skill and ability statements according to their importance for distinguishing superior from satisfactory performance were intercorrelated; 17 factors were extracted and rotated orthogonally. These 17 factors accounted for 61% of the variance, with no single factor accounting for more than 14% or less than 1.2%. The author was able to name 13 of these factors. (See Appendix E for factor information.)

The author named the first factor Problem Solving and Communication. Twenty-five of the 104 skills and abilities, including five representing promising item types, loaded at least .5 on this factor. Fourteen items had to do with reading, writing, or oral communication. Another nine items concerned problem solving.

The second factor was named Secretarial-level Typing and had seven skills or abilities loading at least .5, all of which represent promising item types.

The third factor, labelled Abstract Reasoning and Figure/Spatial Perception, had eight skills or abilities loading at least .5, three of which represent promising item types.

The following factors had from one to six promising item types (number in parentheses):

- V. Arithmetic Computation (three)
- VI. Proofreading and Editing (six)
- VII. Name and Number Checking (four)
- IX. Decision Making (one)
- XI. Arithmetic Reasoning (two)
- XII. Shorthand (two)
- XIII. Low-level Typing (two)

Of the remaining factors that could be named, none had promising item types:

- IV. Psychomotor Ability (five item types represented, but none considered promising because of the expense of this type of test)

¹The skills and abilities that were targeted for measurement by written or performance tests will be referred to as "promising item types." Psychomotor tests were excluded because V.I. considered them too expensive.

VIII. Leadership

X. Awareness

Skills and Abilities for Specific Classes

One of the main objectives of this study was to identify skills and abilities important for performance of clerical or administrative duties. Such identification, if it is to be most meaningful, should be on a class-by-class basis. In most cases the number of raters for individual classes did not reach our standard of six. It was therefore decided to create class families based upon the V.I. classification system. The first class family, called Clerk Typist, was comprised of Clerk Typist I, II, and III. The second class family, Administrative Secretary, was comprised of Administrative Secretary I and II; the third family, Administrative Officer, of Administrative Officer I, II, and III. A position had to be assigned to its original class by MDA in order to be included in the sample.

The skills and abilities that loaded at least .5 on a job behavior dimension and are measureable by promising item types are listed in Table 5. Since the skills and abilities are listed according to the behavior factor(s) on which they loaded at least .5, there are several repeats. Interpretable factors having no promising item type are also listed to show where possible gaps in the testing program may exist. The order of the factors is according to their importance for the total sample, as measured by the mean importance of items loading at least .5 on a factor.

Feasibility of Establishing Minimum Qualifications by Means of a Quantitative Procedure

The following post hoc hypothesis was tested: It is feasible to use data like that generated by the Questionnaire to establish minimum qualifications. The minimum qualification measure used was the incumbent's rating of the level of education necessary to perform the duties of the job in a satisfactory fashion. The predictors included the time-spent factor scores (described above) and the grade of the position. A step-wise multiple regression analysis resulted in grade and 11 factor scores significantly predicting level of education ($R = .77$).

RECOMMENDATIONS FOR THE VIRGIN ISLANDS

The results obtained in this study appear to make a great deal of sense on their own, as well as when they are compared with results of other studies. Unbridled optimism is not warranted, however, in view of the small sample and inability to cross validate.

Class and Grade Determination

The multiple discriminant functions generated in this study provide the best statistical approach presently available for determining a position's most appropriate class. Likewise, the multiple regression equation generated in this study provides the best statistical method for estimating the most appropriate grade. However, due to the limitations mentioned above, statistical estimates should only be treated as hypotheses to be verified by interview, observation, or other empirical means.

TABLE 5

Percent Incumbents Rating an Ability or Skill Important for Distinguishing
Between Satisfactory and Superior Performance

Factor	Promising Item Type	Clerk Typist (N = 11-12)	Administrative Secretary (N = 14-15)	Administrative Officer (N = 10-11)
Proofreading and Editing (VI) ^a	Ability to accurately spell difficult words without referring to a dictionary	50	93	64
	Ability to accurately spell words often found in office memos	67	87	64
	Ability to understand words commonly used in office memos	75	93 ^b	45
	Ability to understand difficult words	83	73 ^b	55
	Ability to consistently use proper grammar and punctuation	83	93	91 ^b
	Ability to understand difficult written paragraphs ^c	67 ^b	80	73
Awareness (X)	No promising item types represented			
Problem Solving and Communication (I)	Ability to understand difficult written paragraphs ^c	67 ^b	80	73
	Ability to determine a writer's purpose, intent, or point of view	62	67	73
	Ability to reason with words	50	73 ^b	64 ^b
	Ability to remember ideas (abstract)	33	44	64
	Ability to derive general concepts or rules from specific cases	25	40	70 ^b

(Continued)

TABLE 5 (Continued)

Factor	Promising Item Type	Clerk Typist (N = 11-12)	Administrative Secretary (N = 14-15)	Administrative Officer (N = 10-11)
Arithmetic Computation (V)	Ability to add or subtract without the aid of a calculator	42 ^b	47	45
	Ability to multiply or divide without the aid of a calculator	33 ^b	47	45
	Ability to use fractions, decimals, and percentages ^c	17	36	64
Decision Making (IX)	Ability to derive general concepts or rules from specific cases ^c	25	40	70
Name and Number Checking (VII)	Ability to quickly and accurately compare numbers for exact likeness	25	40	30
	Ability to quickly and accurately compare names for exact likeness	50	33	30
	Ability to quickly and accurately copy names or numbers	67 ^b	67 ^b	40
	Ability to quickly and accurately code names or numbers	50	36	20
Arithmetic Reason- ing (XI)	Ability to analyze or interpret numerical data like that found in audit reports and financial state- ments	0	21	36
	Ability to use fractions, decimals, and percentages ^c	17	36	64 ^c
Leadership (VIII)	None			
Secretarial-level Typing (II)	Ability to type letters or documents according to standard procedures	58 ^b	93 ^b	70
	Ability to type 50 net WPM	55 ^b	87 ^b	73

(Continued)

TABLE 5 (Continued)

Factor	Promising Item Type	Clerk Typist (N = 11-12)	Administrative Secretary (N = 14-15)	Administrative Officer (N = 10-11)
Psychomotor Ability (IV)	No promising written item types			
Low-level Typing (XIII)	Ability to type 20 net WPM	42	36	10
	Ability to type 35 net WPM	42	43	30
Abstract Reasoning and Figure/Spatial Perception (III)	Ability to mentally manipulate spatial figures in three dimensions	0	0	9
	Ability to reason abstractly using symbols	8	0	19
	Ability to determine inductively the logical relationship among the elements of a pattern	0	0	9
Shorthand (XII)	Ability to take shorthand at 80 WPM	9	27 ^b	30
	Ability to take shorthand at 100 WPM	9	14	20

Note. The varying N's are due to incomplete data for some items.

^aThe Roman numerals refer to the order achieved in factor analysis.

^bThis item type was selected for this class family.

^cThis item type is also represented on another factor.

Test Development

The essential condition for the use of a particular subtest is that SME's judge the skill or ability measured by that subtest to be important for distinguishing between satisfactory and superior performance for a class of positions. Thus, the data from Table 5 were the basis for recommending particular subtests. For each of the class families for which recommendations are made there were at least 10 SME's, a number large enough to produce a fairly reliable mean rating.

For Clerk Typists four subtests, representing five factors (Proofreading and Editing, Problem Solving and Communication, Name and Number Checking, Secretarial-level Typing, and Arithmetic Computation) were selected. One subtest, numerical computations, was selected for use as a selective placement factor, despite being rated important by less than a majority of SME's. Additional documentation on a case-by-case basis will have to be collected to show that this test is being used appropriately.

For Administrative Secretaries four subtests representing five factors (Proofreading and Editing, Problem Solving and Communication, Name and Number Checking, Secretarial-level Typing, and Shorthand), were selected. One subtest, verbal reasoning, can be used to represent two factors (I and VI), inasmuch as such items also measure vocabulary. One subtest, shorthand, was selected as a selective placement factor, despite being rated important by only 27% of Administrative Secretaries. Shorthand should be used as a selective placement factor only for those positions for which it is important.

For Administrative Officers three subtests, representing four factors (Proofreading and Editing, Problem Solving and Communication, Arithmetic Reasoning, and Arithmetic Computation), were selected.

With two exceptions, for each of the three class families the recommended test represents every factor that has a promising item type and an important skill or ability. For each family class there were three factors that did not have promising item types: Awareness, Leadership, and Psychomotor Ability.

These are the recommended subtests:

- Verbal reasoning (ability to reason with words commonly used in office memos)
- Grammar and punctuation (ability to consistently use proper grammar and punctuation)
- Reading comprehension (ability to understand difficult written paragraphs)
- Name & number checking (ability to quickly and accurately copy names and numbers)
- Numerical reasoning (fractions, decimals, percentages)
- Typing (reports at 50 WPM)
- Dictation (ability to take shorthand at 80 WPM)
- Numerical computations (addition, subtraction, multiplication, division)

These eight subtests would comprise three tests, one each for Clerk Typist (comprised of four subtests), Administrative Secretary (four subtests), and Administrative Officer (three subtests). The item types comprising the subtests and the classes for which they are recommended are listed in Table 6. The three subtests listed under "Rank" can be used to rank (but not screen) applicants. A majority of SME's rated the corresponding skills and abilities important for distinguishing between satisfactory and superior performance, but not necessary for barely adequate performance.

The three subtests that can be used to both screen and rank were rated by a majority of the SME's necessary for adequate performance and important for distinguishing between satisfactory and superior performance.

The two subtests listed under "Selective Placement" were rated necessary for adequate performance by a significant number (but not a majority) of SME's. For those positions for which dictation or numerical computations are necessary, the subtests can be used to screen out applicants with inefficient skill or ability.

The basic principles used to develop these recommendations need explication:

1. The subtests for a family of classes should be identical. The job analysis data indicate small differences within class families, e.g., among Administrative Officers I, II, and III. In addition, it is anticipated that a test will be used to select an individual into a family of classes (e.g., into either an Administrative Secretary I or II position), but that movement within that family (i.e., from I to II) will be through reclassification based upon time in grade, recommendation by the supervisor, and final approval by the personnel office.

TABLE 6

Recommended Subtests For Three Class Families

Subtest	Clerk Typist	Administrative Secretary	Administrative Officer
<u>Screen and Rank</u>			
Verbal Reasoning		X	X
Grammar and Punctuation			X
Reading Comprehension	X		
<u>Rank Only</u>			
Name and Number Checking	X	X	
Numerical Reasoning			X
Typing	X	X	
<u>Selective Placement</u>			
Dictation		X	
Numerical Computations	X		

2. The tests for different class families should be different. This approach obviates the undesirable situation where an employee must take a test for promotion that she/he took to be hired.
3. The test battery for a specific class should be comprised of subtests that are relatively independent. For example, for Clerk Typist, although the job analysis data supported the use of a vocabulary subtest, it was not recommended. Since reading comprehension, which was recommended, has been shown to correlate highly with vocabulary (Note 3), the use of both in a test battery is redundant. Additionally, the factor analysis of skills and abilities indicated that vocabulary, grammar and punctuation, and reading comprehension are all measuring the same basic ability: Reading and Writing Skills.
4. Test content should have face validity, to facilitate applicant acceptance of the examining process. This is why typing and inductive reasoning (letter series) were not recommended for Administrative Officers, despite the SME's ratings indicating their importance.

The performance tests in Table 6 are typing and shorthand. Because their administration and scoring is time-consuming, it is recommended that these tests be administered only to those who pass the written tests. In addition, because of widely varying demands for typing and stenographic skills in individual positions, it is recommended that hiring authorities be able to specify a skill level for a specific vacancy. For example, an Administrative Secretary I vacancy with a heavy typing requirement might be filled by an applicant who can type at least 50 WPM, while a vacancy with less typing might be filled by someone who can type at least 35 WPM. In like manner, a vacancy with a significant dictation component might call for someone who can take shorthand at 80 or 100 WPM, while a vacancy with little or no dictation might not require any stenographic skill. The scores of the subtests in any one column to be used for screening could be summed and an overall passing point assigned. As a first approximation, the passing points could be set at approximately one standard deviation below the applicant mean. This assumes an applicant group in which most can do the job satisfactorily. If evidence indicates this assumption is incorrect or if operational factors demand it, this passing point can be adjusted. An overall score for applicants could then be derived by summing the scores for all subtests for which ranking is appropriate.

It is recommended that sufficient numbers of items, of the types enumerated in Table 6, be developed or selected. Sufficient items of most, if not all, types should be available in current V.I. tests. Dr. McAuley's detailed report (Note 4), Item Types in Current V.I. Written Tests, will facilitate the search for items of a particular type. The author's manual (Note 5) entitled Test Development should also prove useful. It is most important, however, to have the services of someone with the requisite knowledges and skills for test development. This individual is responsible for (a) assuring that the tests are reliable and have appropriate cutting points and time limits and (b) setting up necessary security and administrative arrangements.

The judged appropriateness of the various item types could be verified, on a position-by-position basis, by requiring hiring agencies, at the time they request a certificate of qualified applicants, to provide information similar to the type collected in this study. This would allow the examiner to verify that the position belonged to the class claimed.

RECOMMENDATIONS FOR OTHER JURISDICTIONS

A number of the products of this study should be helpful to other jurisdictions. The job evaluation scales require a psychometrician for appropriate application. Before a jurisdiction uses them, it would probably perform the type of research described in this report, including administering the scales to a large number of incumbents, factoring the scales (optional), and correlating the results with grades of incumbents to determine the most valid predictors.

The rest of the job analysis questionnaire--particularly the activity, skill, and ability portions--provides interested jurisdictions an advanced starting point for the analysis of clerical and administrative positions. Such jurisdictions would want to adapt the questionnaire to their own situations by editing, adding, or deleting items as appropriate.

The basic data to support a claim of content validity is derived from the ratings of skill and ability statements. If written in behavioral terms, skill and ability statements describe key aspects of behaviors, e.g., "Ability to quickly and accurately proofread" describes a particular aspect of typing behavior. No attempt was made to identify the motivational aspects of job behaviors, because the technology for measuring these aspects in the examining process is still in its infancy and not as well accepted as ability measurement.²

Behaviors selected for measurement should be critical or important. The approach taken here was to define critical work behaviors as those that are needed for barely acceptable performance. Hence, measures of these behaviors could appropriately be used to identify eligible applicants. Important work behaviors were defined as those that distinguish between satisfactory and superior performance; measures of these could appropriately be used to rank eligible applicants.

A user may decide to collect additional job analysis information before developing a test, e.g., descriptions of work products, setting in which work behaviors are performed, the manner in which skills and abilities are used, the complexity and difficulty of the skills and abilities, and specific training requirements. In some cases, data for documenting the appropriateness of a test may be collected after it is developed. For example, each supervisor, in order to fill a vacancy or promote an employee, might have to describe the work products of the position and relate them to the work behaviors measured in the examination process.

SUMMARY AND DISCUSSION

A job analysis undertaken for the Personnel Office of the U.S. Virgin Islands used questionnaire data provided by clerical and administrative personnel to accomplish several objectives. One objective was to develop a quantitative procedure for assigning positions to classes. Multiple discriminant analysis of ratings of time spent on work activities assigned 69% of the positions to their original classes. It was concluded that the current classifications of positions have validity.

The preceding analysis was based on activity factor scores. Column 1 of Table 2 lists 17 interpretable factors derived from the V.I. activity

²Users interested in studying the motivational aspects of behavior are encouraged to contact the author, as he shares their interest.

data. The other columns of Table 2 list comparable factors from four studies of clerical personnel. Although most of the matching factors are clerical in nature (e.g., Mailing and Steno), some are not (e.g., Bookkeeping and Data Analysis). The non-clerical matches indicate the presence in the Page and Prien samples of personnel performing administrative activities. All factors for which no match was found are administrative in nature, e.g., Auditing and Inspection. In general, both the matches and non-matches of activity factors support the present study and its results.

Another objective was to develop a quantitative procedure for assigning grades to classes of positions. A factor analysis of the 15 job evaluation scales resulted in two interpretable factors, Scope and Complexity. Factor scores for Scope and Complexity were effective predictors of grade ($R = .65$). When ratings of level of education necessary to perform the duties of the job in a satisfactory manner were used in combination with Scope and Complexity to predict grade, the multiple correlation climbed to .73. This correlation is fairly high considering the likelihood of considerable error variance in the grades of individual positions. The use of more reliable class data, as would be the case in practice, should produce a higher correlation. Thus, the feasibility of using a simple job evaluation questionnaire to assign grades to classes of V. I. clerical and administrative positions has been established.

A third objective was to identify and define important skill or ability domains that can be readily operationally defined. First, the validity of criticality/importance ratings of skills and abilities was demonstrated by the finding that 16% of the correlations of these ratings with time-spent ratings of work activities were significant at the .01 level. Post hoc, 16% was judged to be in the desirable range. A much higher figure would indicate the presence of one or more contaminating factors.

Thirteen interpretable factors were extracted from the importance ratings of skill and ability statements. The skill and ability factors, although derived from SME ratings, are not unlike what one would expect from an analysis of test scores measuring the same content areas. The reasonableness of the factors lends some assurance that SME's can meaningfully rate these types of skills and abilities for importance.

It is frequently, but incorrectly, believed that the order in which factors are extracted from ratings parallels the rating scale used, e.g., in this study that the first factor extracted was the most important skill/ability dimension; the second factor, the second most important, etc. The importance of factors was operationally defined as the mean rating of the specific skill or ability statements loading at least .5 on a factor, and correlated with the order in which factors were extracted. The resultant rho was small, .18, and not significant at the .05 level. The skill and ability statements in Table 5 were arranged in the order of the importance of their dimensions for the entire sample.

The factor analysis of the skill and ability statements, and the fact that some of them were written to describe item types, made it a simple task to select a few item types to represent all the important measurable behavioral domains for Clerk Typists, Administrative Secretaries, and Administrative Officers. The general approach was made to represent each skill/ability factor in a test battery for a class, provided that the specific skill or ability chosen represented a promising item type and was important for that class.

A post hoc hypothesis concerned the feasibility of establishing minimum qualifications by means of a quantitative procedure. A step-wise

multiple regression analysis was used to test this hypothesis. The grade of a position and 11 factor scores representing time spent ratings on work activities correlated significantly with the rated level of education necessary to perform the job in a satisfactory fashion ($R = .77$). It is reasonable to assume that the correlation would increase if class data, which would normally be used in an operating situation, were substituted for the single position data used in the present study.

This report demonstrates how a large number of position classes can be included in a single study that has both classification and selection applications. The key features of the study are: the systematic collection of information via a questionnaire administered to a large number of incumbents; appropriate classification of incumbents based on the amount of time spent on work activities; and the identification of skills and abilities, measures of which can legitimately be used to screen and rank applicants. Other features of the study include the validation of (a) job evaluation scales that can be used to assign a grade to a position or class of positions and (b) incumbents' ratings of skills and abilities.

The approach described in this report differs significantly from conventional job analyses. The latter frequently (a) concern themselves with only one position class at a time, (b) cost much more per class, (c) fail to consider the possibility that the classification of a position may be in error, and (d) make inferences about skills and abilities with only limited justification.

While giving lip service to an a priori definition of a population, many researchers either fail to define a population, or if they do, do not randomly sample from it; such an approach bases the process of filling vacancies on the inference that the vacancy is part of a class, because it has the same job title. In the present study the population was not defined a priori, except in a very broad and somewhat amorphous manner (i.e., V.I. clerical and administrative employees, GS-1 through 24). An attempt was made to include all those falling under this rubric, and it was the subgroups of this sample that defined post hoc the population for each class. Although some inappropriate positions were inadvertently included in the sample, this presented no problem inasmuch as they were readily identified by MDA. Conversely, failure to include every single position in the population was also not a problem, because MDA provides a statistical procedure for comparing vacancies to be filled with classes in the sample. In sum, instead of assuming that a position belongs to a class, because of its title, the present approach provides a statistical basis for comparing a position with a class.

Finally one note deserves reemphasizing. When incumbent's grade and current classification were used as criteria (for the validation of the job evaluation scales and the multiple discriminant results, respectively), it was not assumed that these are perfect criteria. On the contrary, it is assumed here that these criteria have a certain amount of error variance and unreliability, and were determined by a process having a large subjective component. Inasmuch as the predictors of these criteria were designed to be valid, reliable, and objective, it is possible that the validated predictors are actually better criteria than the criteria that were used to develop them.

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APPENDIX A

Job Analysis Questionnaire and Instructions for Administering Questionnaire

JOB ANALYSIS QUESTIONNAIRE MODERNIZATION PROJECT GOVERNMENT PERSONNEL OFFICE, U.S.V.I.

We in the Personnel Office are working to improve hiring and promotion practices in Government. But it can't be done without your help. If you will tell us about your job - through this questionnaire - we can make a test that is relevant to your job. You are the expert when it comes to your job. Please give us the advantage of your expert opinion.

You have the approval of the head of your agency to fill out this questionnaire. Most people will finish it in a half hour; some more, some less. If you want to ask somebody for information, that's O.K., - THIS IS NOT A TEST - but remember, in the end we want your opinion. All your answers will be kept confidential.

Don't delay, fill out the questionnaire and enclose it in the attached envelope. Return it to your Personnel Officer or send it directly to the Government Personnel Office.

Fill out this questionnaire only if:

- (1) You are a fulltime employee
- (2) You have been in your job more than three months.
- (3) Your position is in the General Schedule, grade 1 through 24.

Name _____

- (5-6) Department or agency _____
- (7-9) Length of time worked for the V.I. Government _____
(years) (months)
- (10-11) Year of birth: 19 _____
- (12) Sex (Check one): 1. Male _____ 2. Female _____
- (13-18)
- (19-48) Title of your class _____
- (49-51) Length of time you have been in this class _____
(years) (months)
- (52-53) Your present grade: GS _____
- (54) Your present step (Check one): A B C D E F
(1) (2) (3) (4) (5) (6)
- (55-56) Your supervisor's grade: GS _____

Questionnaire Contd.

-2-

- (57) What type of job do you have? (Check one answer)
- ☐ (1) Primarily clerical
 - ☐ (2) Primarily administrative
 - ☐ (3) None of the above
- (58) What type of position do you have? (Check one answer)
- ☐ (1) Classified
 - ☐ (2) Unclassified
 - ☐ (3) Don't know
- (59) What level is your position? (Check as many as apply.)
- ☐ (1) Trainee
 - ☐ (2) Journey man
 - ☐ (3) Master craftsman or troubleshooter
 - ☐ (4) Lead worker
 - ☐ (5) Supervisor of one or two employees
 - ☐ (6) Supervisor of three to six employees
 - ☐ (7) Supervisor of six or more employees
 - ☐ (8) Supervisor of employees who supervise others
- (60) What level of education is necessary to perform the duties of your job in a satisfactory fashion? (Check one answer)
- ☐ (1) Less than high school
 - ☐ (2) High school
 - ☐ (3) One year of college, business school, or secretarial courses (job-related)
 - ☐ (4) Two years of college, business school, or secretarial school courses (job-related)
 - ☐ (5) Six to ten college courses (job-related)
 - ☐ (6) Eleven or more college courses (job-related)
- (61) The previous questions inquired about necessary education for your position. Would additional education above that level usually make one more able to perform the job? Check the highest level of education that will lead to better performance. It will be helpful to think of superior employees in your class. What is their typical education level?
- ☐ (1) Less than high school
 - ☐ (2) High school
 - ☐ (3) One year of college, business school, or secretarial courses (job-related)
 - ☐ (4) Two years of college business school, or secretarial school courses (job-related)
 - ☐ (5) Six to ten college courses (job-related)
 - ☐ (6) Eleven or more college courses (job-related)
- (62-63) How many years of schooling have you completed? _____
- (od 1)

KNOWLEDGE REQUIRED BY THE JOB

Almost every employee has to know certain things in order to satisfactorily perform the duties of the job. Below are listed a number of knowledges, e.g., Medical Science and Conservation. Decide what level of knowledge you need to perform the duties of your position and check the appropriate place.

In most cases you'll check "No Knowledge Required." If you need to understand terms or words in that area, check "Conversant Knowledge of Terms." If you need to be skilled in that area, check "Journeyman Knowledge of Procedures." And if you need a very high level of knowledge, check "Mastery of Principles and Procedures."

Knowledge Area	Level of Mastery Required				
	Mastery of Principles and Procedures	Journeyman Knowledge of Procedures	Conversant Knowledge of Terms	No Knowledge Required	
Supervision					(5)
Conservation					(6)
Interviewing					(7)
V.I. Law					(8)
Psychology					(9)
Public (Media) Relations					(10)
Statistics					(11)
Spelling					(12)
Specialized vocabulary					(13)
Language Usage (Grammar, Punctuation, Capitalization)					(14)
Telephone Etiquette					(15)
Insurance or Real Estate					(16)
(cd 2)	(4)	(3)	(2)	(1)	

Knowledge Required by the Job Contd.

-2-

Knowledge Area	Level of Mastery Required				
	Mastery of Principles and Procedures	Journeyman Knowledge of Procedures	Conversant Knowledge of Terms	No Knowledge Required	
Arithmetic					(17)
Economics					(18)
Algebra					(19)
Typing					(20)
Steno or Speed-writing					(21)
Key punching					(22)
Other Office Equipment or Machines					(23)
Inventory					(24)
Property & Procurement					(25)
General Accounting					(26)
Bookkeeping					(27)
Auditing					(28)
Filing Systems					(29)
Financial Statements					(30)
Office Administration					(31)
Standard Clerical Formats					(32)
Secretarial Administration					(33)
Secretarial or Office Management					(34)
Transportation					(35)
(cd 2)	(4)	(3)	(2)	(1)	

ABILITIES

Certain abilities are needed to perform the duties of your position. Unless someone has each one of these abilities they would be unable to perform your duties, even at a barely acceptable level of performance. The first ability listed below ("Ability to follow your supervisor's directions") is needed for your position. We have therefore put a checkmark in column one.

Some abilities are important for distinguishing between satisfactory and superior workers. The first ability below is important for superior performance. We have therefore put a checkmark in column two.

The second ability ("Ability to ride a horse") is not needed for barely acceptable performance of your position. Neither is it important for superior performance. Therefore, the space to the right of this ability should be left blank.

To sum up, you may check one column - two columns - or no columns.

ABILITY	This ability is needed for barely acceptable performance of your position.	This ability is important for superior performance of your position.	
Ability to follow your supervisor's directions.	✓	✓	
Ability to ride a horse.	(leave blank)	(leave blank)	
Ability to accurately spell difficult words without referring to a dictionary.			(36)
Ability to quickly and accurately proof-read.			(37)
Ability to accurately spell words often found in office memos.			(38)
Ability to understand words commonly used in office memos.			(39)
Ability to understand difficult words.			(40)
Ability to consistently use proper grammar and punctuation.			(41)
Ability to understand difficult written paragraphs.			(42)
Ability to read technical manuals or legal documents.			(43)

(cd 2)

(1)

(2)

If the statement is NOT relevant to your position, leave it blank.

If BOTH columns are relevant to your position, check both columns.

ABILITY	This ability is needed for barely acceptable performance of your position.	This ability is im- portant for superior performance of your position.	
Ability to determine a writer's pur- pose, intent, or point of view.			(44)
Ability to grasp the meaning of poorly expressed writing.			(45)
Ability to reason with words.			(46)
Ability to pick the best words to convey a particular idea.			(47)
Ability to think "on one's feet".			(48)
Ability to adapt to the listener and the situation.			(49)
Ability to orally impart complex, factual information.			(50)
Ability to communicate moderately difficult ideas orally.			(51)
Ability to follow moderately com- plex oral instructions.			(52)
Ability to grasp the meaning of com- plex ideas expressed orally.			(53)
Ability to write in a clear, well- organized, and complete style.			(54)
Ability to impart in writing com- plex, factual information.			(55)
Ability to communicate moderately difficult ideas in writing.			(56)
Ability to learn by being told the answer.			(57)

(cd 2)

(1)

(2)

Abilities Contd.

-3-

	This ability is needed for barely acceptable performance of your position.	This ability is im- portant for superior performance of your position.	
Ability to learn through discovery.			(58)
Ability to memorize the meanings of new words.			(59)
Ability to learn new systems, rules, or procedures that contradict material already learned.			(60)
Ability to learn additional knowledge in one's specialized field.			(61)
Ability to remember material that is not meaningful (e.g. a new language or a coding system)			(62)
Ability to remember sentences for short periods of time.			(63)
Ability to remember ideas (abstract).			(64)
Ability to remember details (things).			(65)
Ability to recognize the existence of problems and identify all the relevant components.			(66)
Ability to recognize need for new approaches.			(67)
Ability to evaluate the appropriate- ness or significance of an idea.			(68)
Ability to organize work efficiently.			(69)
Ability to foresee consequences of actions.			(70)
Ability to make decisions when im- portant pieces of information are missing.			(71)
(cd 2)	(1)	(2)	

Abilities Contd.

-4-

Ability	Needed for barely acceptable performance.	Important for Superior Performance	
Ability to select the best alternative course of action when complete information is available.			(5)
Ability to decide the need for revision of goals, policies, or procedures on the basis of pertinent objectives and requirements.			(6)
Ability to apply general concepts or rules to specific cases.			(7)
Ability to derive general concepts or rules from specific cases.			(8)
Ability to constructively criticize others.			(9)
Ability to gather sufficient facts before making a decision.			(10)
Ability to make decisions on the basis of numerical data.			(11)
Ability to quickly and accurately compare numbers for exact likeness.			(12)
Ability to quickly and accurately compare names for exact likeness.			(13)
Ability to do detailed work very accurately for hours at a time.			(14)
Ability to quickly and accurately copy names or numbers.			(15)
Ability to quickly and accurately code names or numbers.			(16)
Ability to alphabetize material.			(17)
Ability to read diagrams or maps.			(18)
Ability to read blueprints or schematics.			(19)
Ability to accurately compare complex pictures for exact likeness.			(20)
Ability to sort documents or other materials by their shape and size.			(21)

(cd 3)

(1)

(2)

Abilities Contd.

-5-

Ability	Needed for barely acceptable performance.	Important for superior performance.	
Ability to mentally manipulate spatial figures in three dimensions.			(22)
Ability to reason abstractly using symbols.			(23)
Ability to determine inductively the logical relationships among the elements of a pattern.			(24)
Ability to estimate size.			(25)
Ability to see this size print at normal reading distance.			(26)
Ability to estimate quantity.			(27)
Color vision.			(28)
Depth perception.			(29)
Ability to hear a voice at a normal speaking level of loudness.			(30)
Ability to notice small differences in tones.			(31)
Ability to localize sound in three dimensional space.			(32)
Ability to add or subtract without the aid of a calculator.			(33)
Ability to multiply or divide without the aid of a calculator.			(34)
Ability to count.			(35)
Ability to analyze or interpret numerical data like that found in audit reports and financial statements.			(36)
Ability to develop schedules or graphs having numbers.			(37)
Ability to use fractions, decimals, and percentages.			(38)

(cd 3)

(1)

(2)

Abilities Contd.

-6-

Ability	Needed for barely acceptable performance.	Important for Superior Performance	
Ability to do the kind of reasoning required to solve written arithmetic problems.			(39)
Ability to apply statistical formulas.			(40)
Ability to maintain physical activity over prologned periods of time.			(41)
Ability to lift articles weighing more than 40 lbs.			(42)
Ability to make coordinated movements of several fingers or two hands.			(43)
Dexterity of hands and arms.			(44)
Eye-hand coordination.			(45)
Speed, successive tasks.			(46)
Ability to neatly print (by hand) letters or numbers.			(47)
Ability to drive an automobile.			(48)
Pennmanship.			(49)
Ability to type from dictaphone.			(50)
Ability to type letters or documents according to standard procedures.			(51)
Ability to type form letters.			(52)
Ability to type statistical or financial reports which may include, tables, charts, or grapns.			(53)
Ability to type drafts.			(54)
Ability to take dictation and type from notes.			(55)
Ability to type 20 net WPM.			(56)
Ability to type 35 net WPM.			(57)

(cd 3)

(1)

(2)

Ability Contd.
-7-

Ability	Needed for barely acceptable performance.	Important for superior Performance	
Ability to type 50 net WPM.			(58)
Ability to take Shorthand at 60 WPM.			(59)
Ability to take Shorthand at 80 WPM.			(60)
Ability to take Shorthand at 100 WPM.			(61)
Ability to concentrate amidst distractions (such as phone calls, walk-ins, and questions).			(62)
Ability to change one's set quickly from one task to another.			(63)
Ability to develop improved approaches to recurring problems.			(64)
Ability to act in emergencies.			(65)
Ability to act accurately under stress.			(66)
Ability to come up with ingenious solutions to novel problems.			(67)
Ability to get along with others.			(68)
Ability to control the behavior of a group that is seeking to achieve some goal.			(69)
Ability to persuade orally.			(70)
Ability to persuade by means of the written word.			(71)
Ability to resolve problems by means of a bargaining process.			(72)

(cd 3)

(1)

(2)

JOB FACTORS

Jobs differ on certain factors, such as "Scope and Effect." Read the first four statements below. Decide which one of the four statements best describes your position. Place a checkmark to the right of that statement.

Now read the next four statements (at the bottom of this page). Decide which one best describes your present position. Place a checkmark to the right of that statement.

SCOPE AND EFFECT

"Scope and Effect" covers the purpose of the assignment and the effect of work products both within and outside the organization.

(5) Check only one of the following that best describes your present position.

Best describes
your present
position.

1. The purpose of your assignment is to perform specific routine operations that involve a few separate tasks or procedures. _____
2. The purpose of the work you do is to carry out specific rules, regulations, or procedures. _____
3. The purpose of your work assignments is to treat, analyze, or investigate a variety of conditions, problems, or questions. _____
4. The purpose of your work is to plan, develop, and carry out vital administrative programs. _____

(6) Check only one of the following that best describes your present position.

Best describes
your present
position.

1. Your work products have little impact within or beyond your agency. _____
 2. Your work products affect the accuracy, reliability or acceptability of further processes or services. _____
 3. Your work products affect the design or operation of systems, programs, or equipment. _____
 4. Your work products affect the development of major aspects of administrative programs or substantial numbers of people. _____
- (cd 4)

COMPLEXITY

"Complexity" has to do with the nature and variety of tasks, steps, processes, methods, or activities in the work performed; and the degree to which the employee must vary the work, discern interrelationships and deviations, or develop new techniques, criteria or information.

Best describes
your present
position

(7) Check only one of the following that best describes your present position.

1. There is little variation in your work.
2. Variations in your work stem from differences in the sources of information, in the kind of transactions or entries, or other factual situations.
3. Your work requires the interpretation of a variety of data and processes in a speciality field or discipline.

Best describes
your present
position

(8) Check only one of the following that best describes your present position.

1. Actions for you to take are clear-cut.
2. Your duties require consideration of factors and conditions.
3. Factors to be considered involve the assessment of unusual circumstance, variations in approach, incomplete or conflicting data, and incompatible results.

Best describes
your present
position

(9) Check only one of the following that best describes your present position.

1. Your work consists of a few tasks or functions that are clear-cut and directly related.
2. Your work consists of several duties, involving several related steps, process, or methods.
3. Your work consists of various duties involving processes and methods.
4. Your work consists of a variety of duties involving a broad range of activities or depth of analysis for a highly specialized field of work.
(ed 4)

KNOWLEDGE AND SKILL REQUIRED BY THE JOB

"Knowledge and Skill Required by the Job" measures the nature and extent of information or facts which the worker must understand to do acceptable work and the nature and extent of skills necessary to apply these knowledges.

Best describes
your present
position.

(10) Check only one of the following that best describes your present position.

1. Knowledge of simple or routine tasks or operations which typically include following step-by-step instructions.
2. Knowledge of procedures that typically require some training or experience.
3. Knowledge of standard administrative processes.
4. Knowledge of principles and practices needed to perform administrative assignments at the trainee level.
5. Mastery of an administration field.

(11) Check only one of the following that best describes your present position.
(If clerical skills are not required, leave this item blank.)

Best describes
your present
position.

1. Skill to operate simple equipment (e.g., date stampers, mailing machines, or reproduction machines).
2. Skill to operate simple keyboard or switchboard equipment.
3. Specialized office support skills, e.g., ability to type 50 words per minute.
4. Highly specialized office support skills, e.g., ability to take dictation at 110 words per minute or operate a keypunch machine.
5. Highly developed secretarial skills, e.g., the ability to accurately take courtroom testimony with a steno machine.
(od 4)

GUIDELINES

"Guidelines" covers the nature of guidelines and the judgment needed to apply them. "Guidelines" should not be confused with "Knowledge and Skill required To Do the Work." Guidelines tell the employee how to use knowledges and skills.

(12) Check only one of the following that best describes your present position.

Best describes
your present
position.

1. Procedures for doing your work have been established and specific guidelines are available for reference purposes as needed. _____
2. Guidelines are available, but are not completely applicable to your work or have gaps in specificity. _____
3. General administrative policies and precedents exist, but are only limited guidelines for performing your work. _____
4. Guidelines are broadly stated and nonspecific, e.g., broad and general policy statements. _____

(13) Check only one of the following that best describes your present position.

Best describes
your present
position.

1. You work in strictly according to guidelines; deviations must be authorized by your supervisor. _____
2. You use judgment in selecting the appropriate guidelines for application to specific cases; situations to which the existing guidelines cannot be applied are referred to your supervisor. _____
3. You use judgment in interpreting and adapting guidelines for application to specific cases or problems. You analyze results or recommend changes. _____
4. You are recognized as the authority in the development and interpretation of the guidelines. _____
(cd 4)

WORK ENVIRONMENT

(14) The "Work Environment" may subject you to risks, discomforts or unpleasantness. Check only one of the following that best describes your present position.

Best describes
your present
position

1. Your work environment involves normal, everyday risks or discomforts typical of such places as offices, meeting and training rooms, libraries, and residence or commercial vehicles such as airplanes, trains, or buses. The work area is adequately lighted, heated, and ventilated.
2. Your work involves moderate risks, discomforts, or unpleasantness such as a high level of noise and vibrations, dust and grease, contagious diseases or irritant chemicals. Special precautions are required, and you may use protective clothing or gear such as masks, gowns, coats, boots, goggles, gloves or shields.
3. Your work environment involves high risks with exposure to potentially dangerous situations or unusual environmental stress, such as working with explosives, radioactive substances, noxious gases or fumes, at great heights, or subject to possible physical attack. You must apply a wide range of safety and other precautions.

PHYSICAL REQUIREMENTS

The "Physical Requirements" placed on the employee by the work assignment include physical characteristics and abilities (e.g., specific eyesight and dexterity requirements) and the physical exertion involved in the work (e.g., climbing, lifting, pushing, balancing, stooping, kneeling, crouching, crawling, or reaching). To some extent the frequency or intensity of physical exertion must also be considered, e.g., a job requiring prolonged standing involves more physical exertion than a job requiring intermittent standing.

Best describes
your present
position

(15) Check only one of the following that best describes your present position.

1. Your work is sedentary. Typically, you sit comfortably to do your work. However, there may be some walking, standing, bending, carrying of light items such as papers or books, or driving an automobile. No special physical requirements are required to perform the work.
2. Your work requires some physical exertion, such as long periods of standing; walking over tough, uneven, or rocky surfaces; recurring bending, crouching, stooping, stretching, reaching, or similar activities; or recurring lifting of moderately heavy items such as typewriters and record boxes.
3. Your work requires considerable and strenuous physical exertion such as climbing of tall ladders, lifting objects over 50 pounds, frequent crouching or crawling in restricted areas, or defending yourself or others against physical attack.

(cd 4)

SUPERVISORY CONTROLS

"Supervisory Controls" covers the nature and extent of direct or indirect controls exercised by your supervisor, the nature of your responsibility, and the review of completed work.

Best describes
your present
position.

(16) Check only one of the following that best describes your present position.

1. Your supervisor maintains close controls and makes specific assignments with detailed instructions. _____
2. Your supervisor provides detailed instructions for new, difficult, or unusual assignments and may suggest work methods or advice on source material available for routine assignments. _____
3. Your supervisor provides assignments; determines the objectives, priorities, and deadlines; and assists you with unusual situations. _____
4. Your supervisor determines the overall objectives and resources available. You and your supervisor, in consultation, develop the deadlines, projects, and work to be done. _____
5. Your supervisor provides administrative direction with assignments in terms of broadly defined missions or functions. _____

Best describes
your present
position.

(17) Check only one of the following that best describes your present position.

1. You work as instructed and consult with your supervisor on matters not specifically covered in original instructions or guidelines. _____
2. You use initiative in carrying out routine assignments independently without specific instructions, but refer deviations, problems, and situations not covered by instructions to your supervisor for decision and action. _____
3. You plan and carry out the successive steps and handle problems and deviations in the work assignment in accordance with instructions, policies, previous training, or accepted practices in the occupation. _____
4. You, having developed expertise in the line of work, are responsible for planning and carrying out the assignment; resolving most of the conflicts which arise; coordinating the work with others as necessary; and interpreting policy on own initiative in terms of established objectives. You keep your supervisor informed of progress, potentially controversial matters, or far-reaching implications. _____
5. You have responsibility for planning, designing, and carrying out programs, projects, studies, or other work independently. _____
(od 4)

SUPERVISORY CONTROLS (Contd.)

(18) Check only one of the following that best describes your present position.

Best describes
your present
position.

1. Your work is closely reviewed. This review may include checking progress as well as reviewing completed work. _____
2. The supervisor ensures that finished work is accurate and in compliance with instructions or established procedures. _____
3. Completed work is usually evaluated for adequacy, appropriateness, soundness, and conformity to policy and requirements. _____
4. Completed work is reviewed only from an overall standpoint in terms of compatibility with other work, or effectiveness in meeting requirements or expected results. _____
5. Results of your work are considered as technically authoritative and are normally accepted without significant change. _____

PURPOSE OF PERSONAL CONTACTS

(19) "Personal contacts" includes face-to-face contacts and telephone and radio dialogue with persons not in the supervisory chain. (NOTE: Personal contacts with your supervisor are covered under "Supervisory Controls.")

Best describes
your present
position.

Check only one of the following that best describes your present position.

1. The purpose of your personal contacts is to obtain, clarify, or give information directly related to the work. The nature of facts or information ranges from that which is easily understood to highly technical data. _____
2. The purpose of your personal contacts is to plan, coordinate, or advise on work efforts; or to resolve operating problems. The persons contacted are usually working towards mutual goals and generally have co-operative attitudes. _____
3. The purpose is to justify, defend, negotiate, or settle matters involving controversial issues. The persons contacted may have different viewpoints, goals, or objectives requiring convincing them, arriving at a compromise solution, or considering suitable alternatives. _____

(od 4)

DUTIES

You spend your work day doing various things. Please indicate below how much time you spend, in your present position, doing the various activities listed. Estimate how much time you spend - on the average - during a single day. For example, if you do something once every five days and if it takes 10 minutes to do, that would average out to two minutes per day; you would place a checkmark in the category reading, "Less than five minutes per day".

		TIME SPENT PER DAY				
ACTIVITY		None; I never do this	Less than 5 minutes per day	5 to 59 minutes per day	1 to 4 hours per day	More than 4 hours per day
(20)	Folds paper or stuff envelopes by hand.					
(21)	Draws and letter charts, schedules, or graphs for illustrating data.					
(22)	Classifies, sorts, and files correspondence, records, or other data.					
(23)	Collate materials, including collecting pages, stapling assembled pages, and checking the number of copies.					
(24)	Receives and unpacks incoming shipments.					
(25)	Open or sort incoming mail.					
(26)	Distributes or delivers mail.					
(27)	Prepares outgoing mail for distribution.					
(28)	Takes the proceedings of hearings or meetings with a steno machine.					
(29)	Takes dictation from an individual with or without machine, and transcribes notes.					
(30)	Types letters and reports according to standard procedures.					
(31)	Types tables and charts.					
(32)	Types information on forms.					

(cd 4)

(1)

(2)

(3)

(4)

(5)

Duties Contd.

-2-

		TIME SPENT PER DAY				
		None	Less than 5 mins.	5 to 59 mins.	1 to 4 hours	More than 4 hours
(33)	Copies records and other documents using duplication machine.					
(34)	Records and encodes data, using a special purpose machine.					
(35)	Weighs material or products.					
(36)	Operates machine to copy and post data, make computations, and compile records.					
(37)	Operates machines that record, store, process, and print data.					
(38)	Operates machines to proof transactions and keeps qualitative records accounts.					
(39)	Computes arithmetical operations, using calculators or adding machines.					
(40)	Operates machines to address, stuff, fold, seal or stamp outgoing mail.					
(41)	Makes arrangements for payments of money and keeps records of transactions					
(42)	Drives automobile (during working hours).					
(43)	Draws and letters charts, schedules, and graphs for illustrating data.					
(44)	Operates a cash register.					
(45)	Operates a bookkeeping machine.					
(46)	Uses card punch equipment.					
(47)	Uses other EDP equipment.					
(48)	Serves as a receptionist.					
(cd 4)		(1)	(2)	(3)	(4)	(5)

Duties Contd.

-3-

		TIME SPENT PER DAY				
		None	Less than 5 mins.	5 to 59 mins.	1 to 4 hours	More than 4 hours
(49)	Supervises* administrative personnel.					
(50)	Supervises* blue-collar personnel.					
(51)	Supervises* clerical personnel.					
(52)	Represents agency at official functions and meetings.					
(53)	Meets with supervisor.					
(54)	Meets with fellow government employees.					
(55)	Interviews the public.					
(56)	Meets with the press.					
(57)	Deals with public groups.					
(58)	Assists the public in preparing forms or applications.					
(59)	Takes messages.					
(60)	Serves as a telephone receptionist (places calls for others, operates a telephone console, makes telephone surveys, or answers telephone requests for routine information).					
(61)	Runs assigned errands.					
(62)	Arranges for appointments, events, meetings, or travel arrangements.					
(63)	Designs and installs filing systems.					
(64)	Develops and establishes new file categories within a system.					
(65)	Investigates availability of equipment and approves cost estimates of equipment.					
(66)	Analyzes and controls expenditures.					

(1) (2) (3) (4) (5)
* Activities of a supervisor or work-leader includes: Interviewing prospective employees; training subordinates: assigning and distributing work: etc.

(cd 4)

Duties Contd.

-4-

		TIME SPENT PER DAY				
		None	Less than 5 mins.	5 to 59 mins.	1 to 4 hours	More than 4 hours
ACTIVITIES						
(5)	Analyzes data and forecasts trends.					
(6)	Contracts for sale, purchase, and delivery of goods or services.					
(7)	Coordinates maintenance and repair activities.					
(8)	Coordinates personnel programs.					
(9)	Interprets policy and regulations.					
(10)	Enforces administrative policies, operating procedures, or laws.					
(11)	Formulates, initiates, and executes policy or programs.					
(12)	Plans and organizes office practices and procedures.					
(13)	Plans and implements programs.					
(14)	Reviews budget allocations.					
(15)	Resolves complaints of the public.					
(16)	Recommends changes or procedures.					
(17)	Conducts investigations to determine compliance with laws or regulations.					
(18)	Checks that contracts and/or agreements are being fulfilled.					
(19)	Reviews product or service specifications.					
(20)	Sets up controls against the loss of public property and/or monies.					
(21)	Interprets, summarizes, or analyzes quantitative data.					
(22)	Examines, adjusts, adjudicates, or authorizes claims for benefits.					

(cd 5)

(1)

(2)

(3)

(4)

(5)

Duties Contd.

-5-

		TIME SPENT PER DAY				
		None	Less than 5 mins.	5 to 59 mins.	1 to 4 hours	More than 4 hours
(23)	Conducts investigations pertaining to the suitability of persons for benefits or employment.					
(24)	Maintain bookkeeping records.					
(25)	Makes budget estimates.					
(26)	Periodically reviews expenditures to help keep the organization within limitations.					
(27)	Compiles minutes of conferences and/or meetings.					
(28)	Plans office layouts.					
(29)	Prepares contracts in whole or in part.					
(30)	Reads accounting books, audit reports, or financial statements.					
(31)	Reads legal documents.					
(32)	Reads blueprints or schematics.					
(33)	Reads maps or diagrams.					
(34)	Reads statistical data.					
(35)	Trains or orients personnel.					
(36)	Advises high-level decisionmakers.					
(37)	Applies complex guidelines and precedents to specific cases.					
(38)	Learns new skills and knowledges.					
(39)	Orally interpret and explain regulations and policies.					
(40)	Inspects establishments with respect to the compliance with laws.					
(41)	Analyzes current market and price trends.					

(cd 5)

(1)

(2)

(3)

(4)

(5)

Duties Contd.

-6-

		TIME SPENT PER DAY				
		None	Less than 5 mins.	5 to 59 mins.	1 to 4 hours	More than 4 hours
(42)	Develops system of recording transactions into accounts or records.					
(43)	Keeps abreast of latest findings in area of specialization or in general field.					
(44)	Composes simple letters, announcements, or reports.					
(45)	Drafts complex letters, memos, or reports.					
(46)	Gathers and coordinates background material, such as agenda items or drafts of annual reports.					
(47)	Designs new forms, form letters, or report formats.					
(48)	Corrects grammar, punctuation, etc. of someone else's writing.					
(49)	Translates from English into a foreign language, or from a foreign language into English.					
(50)	Keeps records, such as personnel, attendance, or equipment.					
(51)	Computes, classifies, and transcribes data for financial records.					
(52)	Prepares budget for agency.					
(53)	Analyzes and systemizes data relating to transactions and activities into accounts and records.					
(54)	Verifies and records orders of incoming shipments.					
(55)	Prepares invoices, inventories, or requisitions.					
(56)	Catalogs and prepares reference cards for books, manuals, or other publications.					
(cd 5)		(1)	(2)	(3)	(4)	(5)

GOVERNMENT OF
THE VIRGIN ISLANDS OF THE UNITED STATES
PERSONNEL OFFICE

P. O. Box 2336
Charlotte Amalie, St. Thomas, V.I. 00001
809-774-5460

February 24, 1977



MEMORANDUM

TO:

FROM: Walter Mann, Director
Modernization Project

RE: Administration of Job Analysis Questionnaire to Clerical
and Administrative Employees

As you no doubt know, you have been designated to coordinate the administration of a job analysis questionnaire in your agency. The head of your agency has been contacted and has approved the participation of your agency. To ensure prompt, complete cooperation of your agency personnel, it will be necessary to identify, by name, on a list, those who should take the questionnaire in groups of five, ten, or twenty. A conference room is a likely place for convening such a group; a supply of pencils is recommended; most people will finish in an hour.

If group administration is impossible, employees should be given a copy of the questionnaire and provided a reasonable amount of work time to complete it.

The names of those who have completed the questionnaire should be checked on the list. The remainder should be reminded after one week of the importance of the questionnaire.

Participation is on a voluntary basis. Do not announce this fact, but if anyone refuses to take the questionnaire, just tell them, "No one is going to force you to fill out this form." Most people will fill out the form if you explain that it is not a test, the results will be confidential, and the head of your agency wants them to participate.

Completed questionnaires should be forwarded to the Personnel Office, to the attention of Dr. Walter Mann (St. Thomas) or Mrs. Norma Martin (St. Croix).

Your support of this study is appreciated. I will brief Personnel Officers and interested agency representatives after the questionnaires have been analyzed and plans for new tests have been prepared.

Walter G. Mann
Walter G. Mann

APPENDIX B

OFFICE OF
THE GOVERNOR

Memorandum to Department and Agency Heads
Requesting Participation in the Study

GOVERNMENT OF
THE VIRGIN ISLANDS OF THE UNITED STATES
PERSONNEL OFFICE

P. O. Box 2336
Charlotte Amalie, St. Thomas, V.I. 00801
809-774-3660

January 24, 1977



MEMORANDUM

TO: Department and Agency Heads

FROM: Walter G. Mann, Director
Modernization Project

SUBJECT: Job Analysis of Clerical and Administrative Classes

As you may know, grants to the Virgin Islands in excess of \$25 million yearly are dependent upon meeting various personnel requirements prescribed by Federal statute and regulation. In addition, state and local agencies all over the country are being sued over alleged discriminatory hiring practices. The situation has become so critical that the U.S. Civil Service Commission has recommended wholesale changes, and has provided the monetary and technical resources for accomplishing the changes; the Governor has approved the project; and the official announcement of the project by Government House was made several months ago.

The purpose of this memorandum is to call to your attention an upcoming activity of the Modernization Project: a job analysis of all clerical and administrative classes in the classified service. The job analysis will be accomplished by the administration of questionnaires to all incumbents of these classes; the questionnaire will be distributed and collected by personnel you designate. Your personnel officer, or whomever else you may want to make responsible will coordinate the activity in your agency.

Analysis of the results of the questionnaire will allow us to scientifically develop job-related tests for clerical and administrative classes. These new tests will not only fulfill federal requirements, but will provide better ways to measure the ability of applicants for hiring and promotion. Once the new tests are operational, agencies will not be allowed to hire or promote in these classes until appropriate job analysis information is on file in the Personnel Office.

The results of this study - including a documentation of participating agencies - will be made available to the U.S. Civil Service Commission.

As soon as someone has been designated to coordinate this activity, I would like to be informed (774-7175).

Walter G. Mann
Walter G. Mann

APPENDIX C

Computer Print-Outs of Factor Analysis Data for 99 Activities

NOTE - PERCENT OF VARIANCE FOR A ROTATED FACTOR
IS THE SUM OF SQUARES OF THE ROTATED FACTOR
DIVIDED BY THE NUMBER OF VARIABLES, TIMES 100.

		FACTOR SUM OF SQUARES	PERCENT OF VARIANCE	CUMULATIVE PERCENT
1	L1	10.2708	10.4	10.4
2	L2	8.1936	8.3	18.7
3	L3	6.2005	6.3	24.9
4	L4	4.6604	4.7	29.6
5	L5	4.4000	4.4	34.1
6	L6	3.8722	3.9	38.0
7	L7	3.4765	3.5	41.5
8	L8	2.8746	2.9	44.4
9	L9	2.7780	2.8	47.2
10	L10	2.5424	2.6	49.8
11	L11	2.4279	2.5	52.2
12	L12	2.2587	2.3	54.5
13	L13	2.1842	2.2	56.7
14	L14	2.1597	2.2	58.9
15	L15	1.9749	2.0	60.9
16	L16	1.9730	2.0	62.9
17	L17	1.9203	1.9	64.8
18	L18	1.9180	1.9	66.8
19	L19	1.8835	1.9	68.7
20	L20	1.6606	1.7	70.3

SCAN,

IN=DATA,

SDATA=D,

STAYMISS

F.COEF,

SDATA=D,

FACTOR=VFAC,

FC=FSDUTIES,

BADINPUT=USEGOODS

PRINT=3/X/VFACS

POSITION		1	2	3	4	5	6	7	8
	LABEL*	L1	L2	L3	L4	L5	L6	L7	L8
1	DUTY420	-0.058	0.221	-0.096	-0.069	0.733	-0.042	-0.024	0.065
2	DUTY421	0.065	0.302	0.192	0.007	0.131	0.107	0.035	0.089
3	DUTY422	0.035	0.394	-0.061	0.108	0.323	0.063	-0.004	0.224
4	DUTY423	-0.016	0.409	-0.109	-0.090	0.355	-0.096	-0.049	0.089
5	DUTY424	-0.012	0.127	0.120	0.181	0.573	-0.030	0.008	0.152
6	DUTY425	0.109	0.403	0.054	0.014	0.591	-0.029	-0.071	0.065
7	DUTY426	0.082	0.323	-0.057	-0.036	0.643	-0.023	0.100	0.113
8	DUTY427	-0.041	0.392	0.032	-0.045	0.678	0.026	-0.117	-0.096
9	DUTY428	0.067	0.244	-0.035	-0.002	-0.000	-0.026	-0.032	0.067
10	DUTY429	-0.018	0.595	-0.025	0.022	0.082	-0.060	-0.072	0.059
11	DUTY430	-0.044	0.872	-0.105	-0.076	0.144	-0.101	-0.105	0.039
12	DUTY431	-0.003	0.656	0.021	-0.029	0.123	-0.079	-0.040	-0.004
13	DUTY432	-0.016	0.818	-0.030	0.068	0.015	0.034	-0.105	-0.033
14	DUTY433	-0.211	0.570	-0.075	-0.064	0.188	0.065	0.051	0.104
15	DUTY434	-0.113	-0.072	-0.086	-0.086	-0.190	0.017	-0.002	0.013
16	DUTY435	0.071	-0.091	-0.054	0.054	0.161	-0.031	0.080	-0.064
17	DUTY436	-0.063	0.096	-0.108	0.030	0.076	0.763	-0.082	0.023
18	DUTY437	-0.045	0.132	-0.172	0.006	-0.095	0.106	-0.057	-0.322
19	DUTY438	-0.163	-0.026	-0.119	0.038	-0.190	0.791	-0.073	-0.052
20	DUTY439	-0.149	-0.199	0.234	-0.006	0.042	0.438	-0.056	0.160
21	DUTY440	-0.035	0.013	0.039	0.041	0.490	0.114	-0.022	-0.160
22	DUTY441	0.013	0.047	0.278	0.132	0.035	0.135	0.011	0.003
23	DUTY442	0.098	-0.336	-0.137	0.365	0.209	-0.123	0.364	0.226
24	DUTY443	0.256	0.056	0.028	0.145	-0.018	0.029	0.064	0.120
25	DUTY444	-0.044	-0.041	-0.090	-0.005	-0.030	0.082	-0.031	-0.147
26	DUTY445	-0.108	-0.129	-0.001	-0.081	-0.124	0.020	-0.105	-0.027
27	DUTY446	0.028	-0.093	-0.050	0.011	0.067	-0.025	-0.085	-0.050
28	DUTY447	-0.032	-0.121	0.017	0.047	0.182	0.107	0.064	0.112
29	DUTY448	0.009	0.516	-0.020	-0.019	0.354	-0.028	-0.074	-0.006
30	DUTY449	0.439	-0.091	0.172	-0.025	-0.099	-0.083	0.109	0.111
31	DUTY450	0.654	-0.076	-0.014	0.180	0.045	0.059	-0.064	-0.176
32	DUTY451	0.688	0.188	0.141	-0.086	-0.012	-0.014	-0.007	-0.018
33	DUTY452	0.479	0.044	0.118	0.093	0.186	0.093	0.294	0.093
34	DUTY453	0.205	0.175	0.046	0.023	0.190	-0.059	0.126	0.668
35	DUTY454	0.353	0.020	-0.071	0.258	0.044	-0.005	0.148	0.580
36	DUTY455	0.368	-0.071	-0.068	-0.119	-0.069	-0.081	0.130	0.295
37	DUTY456	0.083	-0.052	0.106	0.087	-0.029	-0.006	0.028	-0.045
38	DUTY457	0.328	0.075	0.044	0.050	-0.003	-0.060	0.264	0.061
39	DUTY458	0.207	0.130	0.050	-0.089	-0.054	-0.029	0.085	0.112
40	DUTY459	0.005	0.598	-0.074	0.136	0.383	-0.032	-0.015	0.180
41	DUTY460	0.023	0.653	-0.088	-0.074	0.321	0.041	-0.009	0.014
42	DUTY461	-0.021	0.315	-0.048	0.090	0.627	-0.004	0.109	-0.066
43	DUTY462	0.222	0.723	0.123	0.037	0.151	-0.020	0.093	0.062
44	DUTY463	0.135	0.538	0.110	0.075	0.296	0.051	0.103	0.162
45	DUTY464	0.306	0.462	0.115	0.169	0.227	0.071	0.083	0.046
46	DUTY465	0.250	0.099	0.288	0.730	0.041	0.090	0.151	0.083
47	DUTY466	0.223	-0.055	0.645	0.527	-0.092	0.134	-0.007	0.070
48	DUTY505	0.500	-0.083	0.193	0.278	-0.146	0.077	-0.016	0.040
49	DUTY506	0.086	0.070	0.231	0.764	0.010	0.143	0.079	0.070
50	DUTY507	0.207	-0.004	0.301	0.678	0.025	0.085	-0.056	0.013

*Note: Questionnaire items are represented by three-digit numbers. The first digit is the "cd" number at the bottom of a page. The last two digits are next to the item.

VERIMAX FACTORS OF C

FILE VFAC

POSITION		1	2	3	4	5	6	7	8
	LABEL	L1	L2	L3	L4	L5	L6	L7	L8
51	DUTY508	0.618	0.173	0.319	0.274	-0.098	-0.018	0.058	-0.011
52	DUTY509	0.678	-0.022	0.118	0.373	-0.063	-0.036	0.272	0.170
53	DUTY510	0.632	-0.070	0.138	0.313	-0.071	-0.032	0.348	0.140
54	DUTY511	0.629	-0.082	0.344	-0.000	-0.008	-0.015	0.059	0.201
55	DUTY512	0.762	0.265	0.196	0.083	0.071	0.003	-0.010	0.073
56	DUTY513	0.655	-0.060	0.318	0.042	-0.056	-0.065	0.089	-0.005
57	DUTY514	0.248	-0.005	0.744	0.078	-0.019	0.137	0.068	0.067
58	DUTY515	0.616	0.013	-0.108	0.099	0.093	-0.033	0.391	0.011
59	DUTY516	0.497	0.048	0.227	0.020	0.095	-0.061	0.523	0.215
60	DUTY517	0.418	-0.114	0.118	0.051	-0.090	-0.054	0.701	0.015
61	DUTY518	0.126	-0.148	0.504	0.224	-0.059	0.050	0.381	0.072
62	DUTY519	0.242	-0.039	0.226	0.436	-0.016	0.045	0.502	-0.131
63	DUTY520	0.110	-0.157	0.499	0.218	-0.115	0.077	0.216	0.120
64	DUTY521	0.318	-0.066	0.307	0.198	-0.077	0.062	0.202	0.031
65	DUTY522	0.173	0.042	0.082	0.078	0.069	-0.013	0.014	0.033
66	DUTY523	0.518	-0.022	0.036	0.025	0.016	0.049	-0.000	0.074
67	DUTY524	-0.044	-0.034	0.264	0.068	-0.078	0.728	-0.065	0.014
68	DUTY525	0.278	-0.013	0.618	0.131	0.044	0.063	0.036	0.037
69	DUTY526	0.217	0.031	0.791	0.176	-0.014	0.120	0.170	-0.016
70	DUTY527	0.365	0.634	0.073	-0.024	0.099	0.032	-0.044	-0.092
71	DUTY528	0.373	0.211	0.306	-0.042	0.283	0.046	0.110	0.302
72	DUTY529	0.221	0.059	0.360	0.285	0.079	-0.012	-0.060	-0.031
73	DUTY530	0.021	-0.098	0.431	-0.064	-0.036	0.508	0.324	0.121
74	DUTY531	0.153	0.154	0.147	0.073	-0.074	0.007	0.252	0.307
75	DUTY532	0.129	-0.082	-0.023	0.642	-0.044	0.031	-0.072	0.134
76	DUTY533	0.247	-0.060	0.107	0.355	-0.055	-0.080	0.202	0.228
77	DUTY534	0.263	0.065	0.281	-0.003	-0.020	0.054	0.218	0.325
78	DUTY535	0.676	0.070	0.208	0.308	0.045	0.016	-0.062	0.266
79	DUTY536	0.751	0.043	0.245	0.110	-0.006	0.033	0.083	0.154
80	DUTY537	0.451	0.006	0.309	0.081	-0.081	0.055	0.066	0.213
81	DUTY538	0.198	0.213	0.092	0.187	0.001	0.174	-0.044	0.700
82	DUTY539	0.586	0.093	0.144	0.067	-0.050	-0.008	0.348	0.144
83	DUTY540	0.134	-0.108	0.094	-0.057	0.011	-0.049	0.772	0.078
84	DUTY541	0.176	0.082	0.186	0.207	0.001	0.008	0.236	0.035
85	DUTY542	0.323	0.016	0.380	0.067	-0.009	0.208	-0.002	-0.041
86	DUTY543	0.337	-0.034	0.099	0.398	-0.014	0.022	0.124	0.239
87	DUTY544	0.314	0.463	0.078	0.086	0.046	0.196	0.232	0.247
88	DUTY545	0.502	0.302	0.157	-0.070	0.141	0.041	0.263	0.084
89	DUTY546	0.443	0.159	0.022	0.062	0.085	0.484	0.133	0.069
90	DUTY547	0.484	0.311	0.221	-0.036	0.312	0.089	0.066	0.031
91	DUTY548	0.332	0.547	-0.031	-0.127	0.182	0.007	-0.046	0.200
92	DUTY549	0.134	-0.069	-0.023	-0.047	0.078	0.017	0.081	0.052
93	DUTY550	0.234	0.451	0.130	0.256	0.108	0.010	0.140	0.030
94	DUTY551	0.167	-0.011	0.307	0.120	0.088	0.754	0.028	-0.050
95	DUTY552	0.344	0.110	0.755	0.161	0.005	0.067	-0.021	-0.064
96	DUTY553	0.172	-0.101	0.390	0.241	0.008	0.568	0.003	0.095
97	DUTY554	0.088	0.211	0.282	0.430	0.187	0.256	0.022	-0.086
98	DUTY555	-0.112	0.508	0.193	0.369	0.147	0.148	-0.061	-0.040
99	DUTY556	0.144	0.340	-0.104	0.024	0.158	0.128	0.028	-0.070

VERIMAX FACTORS OF C

FILE VFAC

POSITION		9	10	11	12	13	14	15	16
	LABEL	L9	L10	L11	L12	L13	L14	L15	L16
1	DUTY420	-0.096	-0.073	-0.002	-0.070	0.115	-0.092	0.019	0.028
2	DUTY421	0.167	0.025	0.669	0.054	0.019	-0.045	0.028	0.051
3	DUTY422	-0.099	-0.206	-0.065	-0.193	0.073	0.014	-0.057	0.031
4	DUTY423	0.022	-0.041	-0.018	-0.059	-0.136	-0.044	-0.104	0.217
5	DUTY424	0.230	0.006	0.133	0.014	0.171	0.033	-0.152	-0.198
6	DUTY425	-0.160	-0.057	-0.076	-0.032	-0.001	-0.088	-0.061	0.041
7	DUTY426	-0.036	0.189	-0.036	0.109	0.049	0.009	-0.047	-0.108
8	DUTY427	0.039	0.078	-0.036	0.070	0.038	-0.042	0.037	0.068
9	DUTY428	-0.035	-0.008	-0.113	-0.060	0.091	0.033	-0.038	-0.022
10	DUTY429	0.082	-0.019	-0.071	0.062	-0.072	-0.101	0.022	-0.044
11	DUTY430	-0.043	-0.000	-0.022	-0.022	-0.024	-0.076	-0.045	-0.016
12	DUTY431	-0.067	-0.068	0.185	0.022	0.032	-0.004	-0.095	-0.037
13	DUTY432	0.060	0.005	-0.035	0.016	0.002	0.143	0.088	-0.137
14	DUTY433	0.247	-0.036	0.131	-0.019	-0.056	-0.041	0.073	0.037
15	DUTY434	-0.169	-0.074	0.071	0.619	0.276	0.088	0.021	-0.046
16	DUTY435	0.236	-0.059	-0.141	0.753	-0.037	0.014	0.041	-0.077
17	DUTY436	0.068	0.054	0.175	0.024	0.076	0.163	0.052	0.034
18	DUTY437	-0.039	0.002	0.166	0.039	0.542	0.119	0.074	0.006
19	DUTY438	-0.023	0.088	-0.066	0.048	0.001	0.245	-0.066	0.040
20	DUTY439	0.134	-0.098	0.130	-0.113	-0.017	0.358	0.151	-0.098
21	DUTY440	0.008	0.047	0.078	0.038	-0.065	0.117	0.101	-0.002
22	DUTY441	-0.019	0.003	-0.030	-0.012	0.049	0.078	0.125	-0.051
23	DUTY442	-0.065	0.199	0.063	0.343	0.023	-0.040	-0.131	0.029
24	DUTY443	0.047	0.009	0.761	-0.046	0.005	0.063	-0.003	0.167
25	DUTY444	0.048	0.130	-0.086	-0.064	-0.058	0.741	-0.048	0.019
26	DUTY445	-0.048	-0.031	0.077	0.147	0.026	0.535	0.001	-0.119
27	DUTY446	-0.139	-0.041	-0.018	-0.000	0.826	-0.088	0.030	-0.039
28	DUTY447	0.271	-0.029	-0.049	0.022	0.711	0.053	-0.122	-0.004
29	DUTY448	-0.138	0.041	0.079	-0.099	-0.069	-0.115	0.249	-0.080
30	DUTY449	0.063	0.357	0.094	0.098	-0.040	-0.054	0.187	-0.032
31	DUTY450	0.280	-0.057	0.035	0.103	-0.040	-0.089	0.094	0.007
32	DUTY451	-0.064	0.179	-0.083	0.018	0.039	-0.064	0.009	-0.104
33	DUTY452	0.215	0.266	0.232	0.019	0.111	0.017	-0.019	0.035
34	DUTY453	0.045	0.146	0.169	0.161	0.049	-0.141	0.044	-0.052
35	DUTY454	0.030	0.170	0.180	-0.126	-0.074	0.104	-0.088	-0.049
36	DUTY455	-0.167	0.328	0.168	0.136	-0.040	-0.010	0.371	0.099
37	DUTY456	0.059	0.147	0.134	-0.018	-0.041	-0.067	0.024	0.754
38	DUTY457	-0.086	0.195	0.049	0.217	0.026	0.265	0.172	0.422
39	DUTY458	-0.180	-0.061	0.008	-0.024	0.046	0.528	0.508	0.087
40	DUTY459	-0.147	-0.017	-0.103	-0.147	-0.061	-0.005	0.299	-0.044
41	DUTY460	-0.168	-0.061	0.137	-0.118	0.006	-0.041	0.225	-0.026
42	DUTY461	0.052	-0.015	0.170	0.069	-0.008	0.024	0.224	-0.023
43	DUTY462	-0.071	0.107	0.121	0.007	-0.028	0.016	-0.020	0.170
44	DUTY463	-0.032	-0.090	0.086	-0.012	0.051	0.428	-0.041	0.054
45	DUTY464	-0.053	-0.090	0.144	-0.028	0.279	0.399	-0.091	0.065
46	DUTY465	-0.116	-0.065	0.059	-0.019	0.136	0.045	0.048	-0.008
47	DUTY466	0.126	0.040	0.053	-0.001	-0.059	-0.031	0.026	-0.019
48	DUTY505	0.407	-0.037	0.260	0.062	-0.072	-0.053	-0.074	0.126
49	DUTY506	0.075	-0.050	-0.004	0.028	-0.043	-0.051	0.144	-0.028
50	DUTY507	0.092	0.095	-0.060	0.020	0.071	-0.042	0.014	-0.044

VERIMAX FACTORS OF C

FILE VFAC

POSITION		9	10	11	12	13	14	15	16
	LABEL	L9	L10	L11	L12	L13	L14	L15	L16
51	DUTY508	-0.005	0.038	0.040	0.074	0.075	0.090	0.162	0.084
52	DUTY509	0.089	-0.043	-0.004	-0.005	-0.092	-0.017	0.007	-0.012
53	DUTY510	0.042	0.182	-0.000	0.101	-0.070	0.007	0.080	-0.121
54	DUTY511	0.044	-0.102	0.003	0.041	-0.044	0.039	0.069	0.271
55	DUTY512	0.048	-0.094	0.159	0.019	0.016	0.061	-0.102	-0.037
56	DUTY513	0.241	-0.028	0.030	-0.001	-0.007	-0.012	0.012	0.305
57	DUTY514	0.138	0.030	0.082	0.008	0.014	-0.071	0.118	0.223
58	DUTY515	-0.076	0.277	0.035	0.063	-0.071	0.021	0.240	-0.001
59	DUTY516	0.172	0.123	0.050	-0.042	0.006	-0.030	-0.132	0.118
60	DUTY517	0.143	0.160	0.051	-0.001	-0.048	-0.013	0.125	-0.015
61	DUTY518	0.327	-0.128	0.063	-0.132	0.002	-0.066	0.094	0.229
62	DUTY519	0.267	-0.126	-0.021	0.135	-0.053	0.003	0.105	0.096
63	DUTY520	0.315	-0.083	0.102	-0.187	-0.038	0.023	0.147	-0.018
64	DUTY521	0.640	-0.100	0.185	0.029	-0.005	-0.012	0.017	0.031
65	DUTY522	0.145	-0.011	-0.023	0.051	-0.035	-0.028	0.710	0.028
66	DUTY523	0.038	0.176	0.097	-0.095	-0.083	-0.075	0.231	-0.032
67	DUTY524	-0.159	-0.047	-0.006	0.049	-0.095	-0.194	0.018	-0.049
68	DUTY525	-0.022	0.073	0.060	0.041	-0.041	0.003	-0.045	0.008
69	DUTY526	0.099	-0.020	0.071	-0.024	-0.044	-0.017	0.057	0.032
70	DUTY527	0.112	0.040	-0.053	0.104	0.010	-0.063	-0.004	0.038
71	DUTY528	0.023	0.160	-0.098	0.128	0.341	0.085	-0.045	0.001
72	DUTY529	0.018	0.086	0.101	0.093	-0.024	0.123	0.109	0.128
73	DUTY530	0.167	-0.146	-0.011	-0.102	0.158	0.023	0.032	-0.107
74	DUTY531	0.355	0.404	0.014	0.041	0.027	-0.031	0.109	0.251
75	DUTY532	0.074	0.004	0.146	0.071	-0.007	0.001	-0.146	0.256
76	DUTY533	-0.007	0.524	0.352	-0.067	0.003	-0.022	0.070	0.274
77	DUTY534	0.406	0.278	0.292	-0.064	0.008	-0.084	-0.110	0.211
78	DUTY535	-0.189	-0.049	-0.008	-0.066	0.113	0.037	0.019	0.056
79	DUTY536	0.123	0.259	0.039	0.067	0.151	0.020	0.075	0.091
80	DUTY537	0.572	0.080	-0.001	-0.016	0.088	-0.015	0.236	0.002
81	DUTY538	0.118	-0.012	-0.010	-0.064	-0.051	-0.053	0.180	0.024
82	DUTY539	0.013	0.229	0.092	-0.031	-0.053	-0.119	0.067	-0.050
83	DUTY540	-0.027	0.103	0.037	0.340	-0.003	-0.063	-0.049	0.038
84	DUTY541	-0.121	0.004	0.070	0.633	-0.084	-0.023	0.024	0.143
85	DUTY542	0.071	-0.025	0.362	-0.014	-0.142	0.113	-0.062	-0.169
86	DUTY543	0.127	0.196	0.167	0.303	-0.155	-0.092	-0.041	0.238
87	DUTY544	0.033	-0.121	0.120	-0.147	-0.163	-0.107	-0.160	0.113
88	DUTY545	0.097	-0.055	0.178	-0.107	-0.010	-0.011	-0.113	0.155
89	DUTY546	-0.018	-0.120	0.209	-0.048	-0.077	-0.101	-0.005	0.068
90	DUTY547	-0.040	-0.119	0.273	-0.041	0.017	0.018	0.047	-0.036
91	DUTY548	0.017	-0.030	0.055	-0.019	-0.065	-0.017	-0.081	-0.037
92	DUTY549	-0.032	0.827	-0.072	-0.071	-0.054	0.077	-0.053	0.091
93	DUTY550	-0.154	0.274	0.164	-0.102	-0.062	-0.096	-0.134	-0.247
94	DUTY551	0.070	0.016	-0.026	-0.054	0.072	-0.079	-0.052	-0.033
95	DUTY552	-0.034	0.075	-0.044	0.107	-0.029	0.031	-0.100	-0.052
96	DUTY553	0.134	-0.046	-0.081	-0.050	0.110	-0.008	-0.084	0.013
97	DUTY554	0.274	0.003	0.217	0.082	0.008	-0.080	0.004	-0.155
98	DUTY555	0.201	0.124	-0.003	0.078	-0.053	-0.084	-0.003	-0.255
99	DUTY556	0.163	0.037	0.107	0.067	-0.039	0.121	-0.129	0.013

VERIMAX FACTORS OF C

FILE VFAC

POSITION		17	18	19	20
	LABEL	L17	L18	L19	L20
1	DUTY420	-0.032	-0.029	0.009	0.099
2	DUTY421	0.213	-0.100	-0.142	0.108
3	DUTY422	-0.011	-0.099	0.096	0.211
4	DUTY423	-0.163	-0.093	-0.106	0.299
5	DUTY424	0.024	0.047	0.272	-0.040
6	DUTY425	0.187	0.022	0.175	0.036
7	DUTY426	0.069	-0.033	-0.107	-0.041
8	DUTY427	0.150	-0.057	0.038	0.019
9	DUTY428	-0.055	0.785	0.106	0.123
10	DUTY429	0.086	0.416	0.013	-0.122
11	DUTY430	0.025	0.032	0.030	0.081
12	DUTY431	-0.131	0.019	-0.300	0.041
13	DUTY432	-0.155	-0.175	0.022	0.139
14	DUTY433	0.119	0.022	-0.234	0.118
15	DUTY434	0.264	0.041	0.098	0.022
16	DUTY435	-0.087	-0.004	0.066	-0.037
17	DUTY436	0.040	0.044	0.090	0.088
18	DUTY437	0.012	0.229	-0.120	0.288
19	DUTY438	0.018	0.004	-0.054	0.020
20	DUTY439	-0.136	-0.083	-0.008	0.147
21	DUTY440	-0.012	0.313	-0.346	0.350
22	DUTY441	0.003	0.099	0.032	0.715
23	DUTY442	0.031	0.089	-0.141	-0.075
24	DUTY443	-0.015	-0.019	0.132	-0.111
25	DUTY444	-0.025	-0.019	0.002	0.167
26	DUTY445	0.137	0.036	0.012	-0.122
27	DUTY446	0.050	0.021	-0.001	-0.005
28	DUTY447	-0.117	-0.061	0.043	-0.042
29	DUTY448	-0.123	0.267	0.289	-0.193
30	DUTY449	0.222	0.401	-0.062	-0.021
31	DUTY450	0.142	0.016	0.172	0.001
32	DUTY451	0.035	0.142	0.159	0.168
33	DUTY452	-0.123	0.168	-0.152	0.080
34	DUTY453	-0.008	0.140	0.029	0.114
35	DUTY454	0.107	0.072	-0.017	-0.027
36	DUTY455	-0.004	0.020	0.145	0.153
37	DUTY456	0.054	-0.027	-0.011	-0.026
38	DUTY457	0.015	-0.031	0.377	-0.027
39	DUTY458	-0.209	-0.073	0.076	0.055
40	DUTY459	-0.028	0.086	0.142	-0.006
41	DUTY460	-0.073	0.083	0.225	-0.108
42	DUTY461	-0.240	0.047	-0.091	-0.167
43	DUTY462	0.134	0.093	0.119	-0.132
44	DUTY463	-0.018	0.239	0.047	0.017
45	DUTY464	-0.046	0.107	0.046	-0.128
46	DUTY465	-0.127	0.081	-0.052	-0.063
47	DUTY466	0.072	0.016	-0.028	0.071
48	DUTY505	-0.029	-0.071	0.068	0.073
49	DUTY506	0.175	0.003	0.094	0.154
50	DUTY507	0.079	-0.130	0.056	-0.032

VERIMAX FACTORS OF C
POSITION

PAGE 6
FILE VFAC

		17	18	19	20
	LABEL	L17	L18	L19	L20
51	DUTY508	-0.086	0.052	-0.147	-0.007
52	DUTY509	0.071	-0.081	0.026	0.019
53	DUTY510	-0.081	0.038	0.015	0.017
54	DUTY511	-0.053	-0.071	-0.009	0.030
55	DUTY512	-0.052	0.091	0.080	-0.098
56	DUTY513	0.033	-0.085	0.090	-0.062
57	DUTY514	-0.015	-0.042	-0.007	0.098
58	DUTY515	0.054	0.077	0.084	-0.071
59	DUTY516	0.158	-0.000	-0.057	0.018
60	DUTY517	0.014	0.042	-0.022	-0.030
61	DUTY518	0.285	0.044	0.170	0.013
62	DUTY519	0.110	-0.050	0.036	0.003
63	DUTY520	0.209	0.039	0.127	-0.104
64	DUTY521	-0.076	0.014	0.071	-0.005
65	DUTY522	0.103	-0.002	-0.086	0.090
66	DUTY523	0.404	0.043	-0.292	-0.020
67	DUTY524	-0.131	-0.036	-0.046	0.041
68	DUTY525	0.039	0.074	-0.086	0.056
69	DUTY526	0.046	-0.007	-0.022	0.082
70	DUTY527	-0.027	0.151	0.081	-0.090
71	DUTY528	-0.096	0.078	-0.116	-0.095
72	DUTY529	0.525	-0.093	-0.032	-0.049
73	DUTY530	0.003	-0.085	-0.044	0.118
74	DUTY531	0.180	0.102	0.118	-0.017
75	DUTY532	-0.095	0.068	-0.113	0.038
76	DUTY533	-0.039	-0.012	0.049	-0.070
77	DUTY534	0.039	-0.110	-0.015	0.072
78	DUTY535	0.036	0.089	-0.021	-0.081
79	DUTY536	0.052	-0.106	-0.159	-0.056
80	DUTY537	0.055	0.003	-0.034	-0.069
81	DUTY538	-0.001	-0.048	-0.046	-0.092
82	DUTY539	-0.045	-0.230	0.049	0.041
83	DUTY540	-0.135	-0.068	0.061	0.010
84	DUTY541	-0.062	-0.075	-0.096	0.017
85	DUTY542	-0.218	-0.179	0.132	0.088
86	DUTY543	-0.107	0.090	0.304	0.093
87	DUTY544	0.276	0.010	-0.022	0.202
88	DUTY545	0.277	0.038	0.119	0.164
89	DUTY546	0.071	0.062	0.078	-0.072
90	DUTY547	0.207	0.139	0.013	0.059
91	DUTY548	0.400	-0.010	-0.139	0.035
92	DUTY549	0.010	-0.010	0.003	0.011
93	DUTY550	0.235	-0.103	0.146	0.060
94	DUTY551	0.064	0.012	0.005	0.052
95	DUTY552	-0.022	-0.034	0.024	0.046
96	DUTY553	0.057	-0.088	0.063	-0.150
97	DUTY554	0.055	-0.006	0.302	0.287
98	DUTY555	0.186	-0.181	0.102	0.212
99	DUTY556	-0.094	0.329	0.584	0.078

SAVE=FSDUTIES

FILE FSDUTIES 160 ROWS BY 20 COLUMNS.
HAS BEEN SAVED ON PDT 20 AS FILE 12, FIRST BLOCK IS 273.

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APPENDIX D

Computer Print-Out of Factor Analysis Data for 15 Job Evaluation Scales

NOTE - PERCENT OF VARIANCE FOR A ROTATED FACTOR
IS THE SUM OF SQUARES OF THE ROTATED FACTOR
DIVIDED BY THE NUMBER OF VARIABLES, TIMES 100.

		FACTOR SUM OF SQUARES	PERCENT OF VARIANCE	CUMULATIVE PERCENT
1	L1	4.0161	26.8	26.8
2	L2	2.4794	16.5	43.3
3	L3	1.7379	11.6	54.9

VERIMAX FACTORS OF C

POSITION		1	2	3
	LABEL	L1	L2	L3
1	SCOPE1	0.551	0.495	0.278
2	SCOPE2	0.508	0.330	0.116
3	COMPLEXITY1	0.470	0.597	0.034
4	COMPLEXITY2	0.130	0.850	0.138
5	COMPLEXITY3	0.296	0.804	0.119
6	KNOWLEDGE.1	0.589	0.301	-0.196
7	SKILL.1	0.432	-0.289	-0.567
8	GUIDELINES1	0.616	0.232	-0.032
9	GUIDELINES2	0.688	0.034	0.194
10	ENVIRONMENT	0.259	0.040	0.647
11	PHYSICAL.REQ	0.047	0.079	0.810
12	SUP.CONTROL1	0.694	0.225	-0.070
13	SUP.CONTROL2	0.780	0.117	0.154
14	SUP.CONTROL3	0.580	0.224	0.083
15	CONTACTS	0.498	0.221	0.322

APPENDIX E

Computer Print-Outs of Factor Analysis Data for 104 Skills and Abilities

NOTE - PERCENT OF VARIANCE FOR A ROTATED FACTOR
IS THE SUM OF SQUARES OF THE ROTATED FACTOR
DIVIDED BY THE NUMBER OF VARIABLES, TIMES 100.

		FACTOR SUM OF SQUARES	PERCENT OF VARIANCE	CUMULATIVE PERCENT
1	L1	14.8555	14.3	14.3
2	L2	5.8741	5.6	19.9
3	L3	5.6872	5.5	25.4
4	L4	5.1756	5.0	30.4
5	L5	4.4021	4.2	34.6
6	L6	4.1527	4.0	38.6
7	L7	3.9653	3.8	42.4
8	L8	3.3665	3.2	45.7
9	L9	2.5303	2.4	48.1
10	L10	2.3871	2.3	50.4
11	L11	1.9180	1.8	52.2
12	L12	1.8357	1.8	54.0
13	L13	1.6268	1.6	55.6
14	L14	1.5915	1.5	57.1
15	L15	1.5714	1.5	58.6
16	L16	1.4649	1.4	60.0
17	L17	1.2080	1.2	61.2

PRINT#3/VFSUPs

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ITERATIVE FA OF SUPERIOR ABILITIES

PAGE 1

VERIMAX FACTORS OF FSUP

FILE VFSUP

POSITION		1	2	3	4	5	6	7	8
	LABEL	L1	L2	L3	L4	L5	L6	L7	L8
1	ABILITY236	0.179	0.184	-0.064	0.058	0.087	0.636	-0.032	0.203
2	ABILITY237	0.156	0.208	-0.033	0.099	0.045	0.684	0.031	0.082
3	ABILITY238	0.255	0.136	0.070	0.085	0.085	0.693	0.114	0.070
4	ABILITY239	0.261	0.149	0.117	0.175	0.138	0.639	0.054	-0.023
5	ABILITY240	0.301	0.183	0.060	0.040	-0.033	0.624	0.111	0.103
6	ABILITY241	0.363	0.259	0.059	-0.023	-0.063	0.577	0.000	-0.013
7	ABILITY242	0.531	0.129	0.029	0.083	-0.101	0.548	0.050	-0.028
8	ABILITY243	0.405	-0.081	0.173	-0.036	0.034	0.308	-0.005	0.069
9	ABILITY244	0.726	0.109	0.075	0.206	0.016	0.191	-0.003	0.048
10	ABILITY245	0.562	0.273	0.094	0.152	0.139	0.327	0.091	-0.019
11	ABILITY246	0.658	0.066	0.057	0.200	0.048	0.177	0.080	0.197
12	ABILITY247	0.679	0.084	0.019	0.153	0.100	0.274	-0.006	0.120
13	ABILITY248	0.602	0.002	0.109	0.140	-0.012	0.133	-0.030	0.143
14	ABILITY249	0.667	0.058	0.067	0.113	0.087	0.037	0.190	0.109
15	ABILITY250	0.729	-0.047	0.194	-0.028	0.063	0.129	0.123	0.198
16	ABILITY251	0.707	-0.059	0.074	0.018	0.105	0.081	0.119	0.094
17	ABILITY252	0.593	-0.009	0.048	0.119	0.065	0.184	0.178	-0.008
18	ABILITY253	0.653	-0.006	0.122	0.164	0.033	0.149	0.086	0.070
19	ABILITY254	0.583	0.080	-0.037	-0.047	0.145	0.163	0.038	0.051
20	ABILITY255	0.705	0.010	0.075	0.004	-0.041	0.128	0.018	0.151
21	ABILITY256	0.732	0.112	0.139	0.108	-0.011	0.084	-0.105	0.076
22	ABILITY257	0.294	-0.019	-0.031	0.152	-0.118	0.027	0.290	0.066
23	ABILITY258	0.374	-0.026	0.073	0.112	0.094	0.130	0.255	0.228
24	ABILITY259	0.420	0.113	0.021	0.360	0.117	0.104	0.132	0.098
25	ABILITY260	0.371	0.127	0.164	0.049	0.156	0.036	0.299	-0.029
26	ABILITY261	0.509	-0.012	0.078	-0.013	0.158	-0.047	0.171	-0.115
27	ABILITY262	0.232	0.211	0.181	0.206	0.019	-0.008	0.357	0.050
28	ABILITY263	0.277	0.257	0.104	0.275	-0.034	0.132	0.163	0.118
29	ABILITY264	0.600	0.129	0.140	0.220	0.007	0.088	0.108	0.076
30	ABILITY265	0.443	0.165	-0.060	0.134	0.228	0.156	-0.008	-0.066
31	ABILITY266	0.611	0.014	0.147	-0.021	0.077	-0.040	0.045	0.128
32	ABILITY267	0.725	-0.055	0.126	-0.034	0.197	0.052	0.054	0.082
33	ABILITY268	0.657	0.022	0.194	0.112	0.085	0.064	0.246	0.189
34	ABILITY269	0.495	0.201	0.034	0.036	0.228	0.045	0.004	-0.035
35	ABILITY270	0.031	0.060	0.098	0.051	-0.027	0.040	0.090	0.094
36	ABILITY271	0.499	0.178	0.126	0.019	0.269	0.125	0.098	0.019
37	ABILITY305	0.590	-0.020	0.148	0.126	0.089	0.011	0.120	0.127
38	ABILITY306	0.567	-0.121	0.277	0.063	-0.084	0.113	0.065	0.295
39	ABILITY307	0.473	-0.020	0.189	0.162	0.116	-0.062	0.202	0.120
40	ABILITY308	0.512	-0.004	0.202	0.177	0.120	0.005	0.150	0.152
41	ABILITY309	0.485	-0.083	0.096	0.120	-0.012	0.030	-0.031	0.259
42	ABILITY310	0.518	-0.021	0.160	0.042	0.104	0.121	0.143	0.010
43	ABILITY311	0.457	-0.150	0.095	0.152	0.209	-0.022	0.359	0.049
44	ABILITY312	0.175	0.037	0.096	0.238	0.265	-0.049	0.684	0.082
45	ABILITY313	0.183	0.059	0.069	0.138	0.158	0.071	0.755	0.054
46	ABILITY314	0.289	0.157	0.072	0.083	0.218	0.089	0.400	-0.032
47	ABILITY315	0.128	0.250	-0.024	0.213	0.338	0.116	0.556	0.046
48	ABILITY316	0.126	0.163	0.072	0.216	0.252	0.094	0.642	-0.062
49	ABILITY317	0.182	0.398	0.043	0.083	0.228	0.200	0.411	0.033
50	ABILITY318	0.172	-0.044	0.538	0.105	0.195	0.120	0.108	0.174

ITERATIVE FA OF SUPERIOR ABILITIES

PAGE 2

VERIMAX FACTORS OF FSUP

FILE VFSUP

POSITION		1	2	3	4	5	6	7	8
	LABEL	L1	L2	L3	L4	L5	L6	L7	L8
51	ABILITY319	0.105	0.029	0.744	-0.017	-0.039	-0.085	-0.044	0.039
52	ABILITY320	0.120	0.110	0.647	0.273	0.020	-0.078	0.130	0.157
53	ABILITY321	0.119	0.158	0.242	0.381	0.033	-0.048	0.283	0.064
54	ABILITY322	0.047	0.004	0.595	-0.121	0.024	-0.027	0.135	0.027
55	ABILITY323	0.228	-0.131	0.680	0.073	-0.005	0.112	-0.027	-0.011
56	ABILITY324	0.171	-0.153	0.610	0.197	0.142	0.138	-0.067	0.057
57	ABILITY325	0.062	0.077	0.506	0.341	0.193	0.065	0.031	0.197
58	ABILITY326	0.180	0.033	0.251	0.389	0.209	0.188	0.056	-0.038
59	ABILITY327	0.179	0.012	0.314	0.356	0.322	0.194	0.117	0.221
60	ABILITY328	0.137	0.056	0.349	0.609	0.135	-0.024	0.125	0.040
61	ABILITY329	0.163	0.053	0.483	0.488	0.172	0.023	0.086	0.118
62	ABILITY330	0.136	0.054	0.242	0.360	0.251	0.171	-0.005	0.033
63	ABILITY331	0.198	0.138	0.485	0.296	0.157	0.055	0.026	0.259
64	ABILITY332	0.049	0.101	0.420	0.368	0.045	0.071	0.154	0.121
65	ABILITY333	0.188	-0.033	0.146	0.128	0.802	0.085	0.227	0.054
66	ABILITY334	0.206	-0.053	0.153	0.038	0.794	0.099	0.266	0.030
67	ABILITY335	0.070	0.019	-0.009	0.113	0.698	0.079	0.222	-0.014
68	ABILITY336	0.163	-0.076	0.138	0.160	0.387	-0.046	0.084	0.285
69	ABILITY337	0.277	-0.108	0.365	0.203	0.173	0.031	0.039	0.214
70	ABILITY338	0.260	-0.038	0.212	0.107	0.521	-0.049	0.091	0.202
71	ABILITY339	0.222	-0.039	0.300	0.159	0.422	-0.033	0.193	0.196
72	ABILITY340	0.226	-0.087	0.535	0.026	0.040	-0.006	0.155	0.140
73	ABILITY341	0.286	-0.027	0.308	0.351	0.095	0.053	0.175	0.167
74	ABILITY342	0.115	-0.104	0.255	0.253	0.070	-0.053	0.087	-0.066
75	ABILITY343	0.066	0.138	0.108	0.578	0.079	0.009	0.252	0.082
76	ABILITY344	0.088	0.160	0.127	0.682	0.150	0.128	0.097	0.056
77	ABILITY345	0.170	0.123	0.099	0.789	0.056	0.117	0.167	-0.026
78	ABILITY346	0.227	0.158	0.148	0.580	0.128	0.165	0.116	0.063
79	ABILITY347	0.057	0.205	0.076	0.188	0.514	-0.069	0.143	-0.058
80	ABILITY348	0.141	-0.045	0.164	0.236	0.081	0.062	-0.062	0.136
81	ABILITY349	0.232	0.149	-0.007	0.252	0.366	-0.036	0.108	0.083
82	ABILITY350	0.236	0.617	0.075	0.088	-0.036	0.001	0.072	0.121
83	ABILITY351	-0.042	0.839	0.027	0.111	0.095	0.203	0.031	-0.080
84	ABILITY352	0.053	0.851	-0.038	0.131	0.118	0.175	-0.006	-0.034
85	ABILITY353	0.044	0.792	-0.023	0.072	0.001	0.040	0.182	-0.018
86	ABILITY354	0.066	0.655	-0.122	0.197	-0.136	0.135	0.036	0.101
87	ABILITY355	0.040	0.659	-0.049	0.145	-0.134	0.113	0.007	-0.041
88	ABILITY356	-0.051	0.332	0.006	0.067	0.083	0.111	0.090	0.045
89	ABILITY357	-0.042	0.447	0.057	0.084	0.064	0.050	0.097	0.130
90	ABILITY358	-0.024	0.672	-0.043	-0.086	0.049	0.170	0.102	-0.057
91	ABILITY359	0.057	0.329	-0.001	-0.074	0.013	0.118	0.044	-0.032
92	ABILITY360	0.092	0.359	0.054	-0.007	-0.066	0.122	-0.069	-0.012
93	ABILITY361	0.053	0.262	0.179	0.018	0.120	0.016	-0.023	0.149
94	ABILITY362	0.369	0.282	-0.077	0.223	0.223	0.061	0.009	0.108
95	ABILITY363	0.196	0.184	0.013	0.156	0.152	0.098	0.288	0.250
96	ABILITY364	0.398	-0.116	0.054	0.141	0.136	0.085	0.121	0.328
97	ABILITY365	0.331	0.160	0.157	0.176	0.094	0.156	0.200	0.124
98	ABILITY366	0.411	0.159	0.105	0.142	0.082	0.212	0.223	0.283
99	ABILITY367	0.358	-0.094	0.282	0.139	0.079	0.023	0.056	0.470
100	ABILITY368	0.382	0.176	-0.055	0.111	0.150	0.218	0.153	0.084

ITERATIVE FA OF SUPERIOR ABILITIES

PAGE 3

VERIMAX FACTORS OF FSUP

FILE VFSUP

POSITION		9	10	11	12	13	14	15	16
	LABEL	L9	L10	L11	L12	L13	L14	L15	L16
1	ABILITY236	-0.024	-0.072	0.068	0.162	0.017	0.101	-0.152	0.098
2	ABILITY237	0.208	0.012	-0.038	0.016	0.004	-0.026	0.135	0.187
3	ABILITY238	0.020	0.264	-0.132	-0.011	0.078	0.010	0.103	-0.018
4	ABILITY239	-0.011	0.215	-0.145	-0.014	0.029	0.048	0.115	0.000
5	ABILITY240	-0.029	-0.010	0.094	0.077	0.068	0.082	-0.059	-0.085
6	ABILITY241	-0.113	0.085	0.056	-0.006	0.039	-0.043	-0.002	-0.219
7	ABILITY242	0.024	-0.072	0.137	0.047	0.073	0.006	-0.012	-0.078
8	ABILITY243	0.152	-0.221	0.364	-0.059	-0.082	-0.106	0.099	-0.053
9	ABILITY244	0.072	0.093	-0.003	-0.052	-0.096	-0.076	0.137	-0.116
10	ABILITY245	-0.032	0.053	-0.025	-0.042	-0.111	-0.014	0.059	-0.048
11	ABILITY246	-0.160	0.148	-0.004	0.016	-0.115	0.004	0.022	-0.117
12	ABILITY247	-0.022	-0.064	-0.065	0.030	-0.167	-0.071	-0.022	0.146
13	ABILITY248	0.055	0.196	-0.028	0.076	-0.233	-0.149	0.002	0.018
14	ABILITY249	0.049	0.054	-0.160	-0.028	-0.025	0.040	0.027	0.119
15	ABILITY250	0.111	0.069	-0.053	0.036	-0.009	0.128	-0.082	0.033
16	ABILITY251	0.057	0.070	-0.096	0.011	-0.031	0.018	-0.018	0.105
17	ABILITY252	-0.022	0.061	-0.051	0.021	0.005	0.011	-0.184	0.057
18	ABILITY253	-0.002	0.035	-0.070	0.002	0.042	0.063	-0.292	-0.015
19	ABILITY254	-0.038	-0.075	0.071	0.059	0.050	0.164	0.100	-0.071
20	ABILITY255	-0.135	-0.093	0.051	0.100	0.109	0.048	0.059	-0.063
21	ABILITY256	0.027	-0.059	0.009	0.006	0.177	-0.039	0.083	0.134
22	ABILITY257	0.029	-0.004	0.035	0.007	-0.076	0.484	-0.009	-0.005
23	ABILITY258	0.158	0.078	0.009	0.095	0.078	0.313	0.135	0.126
24	ABILITY259	-0.043	-0.098	-0.012	0.008	-0.037	0.058	0.292	0.042
25	ABILITY260	0.107	0.148	0.135	0.046	-0.188	0.242	0.198	0.057
26	ABILITY261	0.120	0.105	0.152	0.096	-0.091	0.027	0.029	-0.023
27	ABILITY262	-0.040	-0.030	0.125	-0.070	0.041	0.059	0.206	0.056
28	ABILITY263	0.120	0.004	-0.097	-0.009	0.056	0.181	0.471	0.096
29	ABILITY264	0.085	0.039	0.075	-0.028	0.043	-0.025	0.334	0.116
30	ABILITY265	0.161	0.015	0.047	0.064	0.011	-0.004	0.340	0.117
31	ABILITY266	0.236	-0.001	0.121	-0.002	-0.002	0.146	-0.034	0.140
32	ABILITY267	0.120	0.125	0.055	-0.019	0.124	0.119	0.047	0.113
33	ABILITY268	0.179	0.004	0.106	-0.041	-0.048	0.026	0.015	0.050
34	ABILITY269	0.082	0.321	0.051	-0.002	0.006	0.110	0.006	-0.035
35	ABILITY270	0.086	0.188	0.125	0.008	0.142	0.135	0.221	0.083
36	ABILITY271	0.181	0.122	-0.018	-0.052	0.019	0.159	-0.068	-0.169
37	ABILITY305	0.465	0.148	0.025	0.066	0.078	0.163	-0.008	0.005
38	ABILITY306	0.395	-0.050	0.085	0.062	0.031	-0.072	0.165	-0.048
39	ABILITY307	0.440	0.098	0.029	-0.017	0.015	0.065	0.024	-0.024
40	ABILITY308	0.490	0.026	0.035	-0.093	0.018	0.046	0.065	-0.081
41	ABILITY309	0.426	0.042	0.042	0.102	-0.020	-0.052	0.149	-0.000
42	ABILITY310	0.569	0.120	-0.037	0.002	-0.005	0.139	0.003	0.066
43	ABILITY311	0.417	-0.088	0.199	0.091	0.039	-0.110	0.046	-0.060
44	ABILITY312	0.087	0.131	0.122	-0.017	0.061	-0.046	0.007	0.037
45	ABILITY313	-0.007	0.106	0.030	-0.045	0.139	0.045	-0.008	-0.034
46	ABILITY314	0.105	0.161	0.203	0.115	-0.017	0.047	-0.020	0.015
47	ABILITY315	0.004	0.105	-0.114	-0.036	-0.003	0.086	-0.024	0.092
48	ABILITY316	0.183	-0.029	-0.073	-0.047	-0.003	0.133	0.033	-0.026
49	ABILITY317	-0.071	-0.008	-0.108	0.031	-0.012	0.112	0.226	0.090
50	ABILITY318	0.122	-0.137	-0.020	-0.054	-0.004	-0.189	0.110	0.113

ITERATIVE FA OF SUPERIOR ABILITIES

PAGE 4

VERIMAX FACTORS OF FSUP

FILE VFSUP

POSITION		9	10	11	12	13	14	15	16
	LABEL	L9	L10	L11	L12	L13	L14	L15	L16
51	ABILITY319	0.051	0.164	-0.008	0.022	-0.092	-0.033	-0.047	0.072
52	ABILITY320	0.075	-0.043	-0.156	0.104	0.024	0.032	-0.074	-0.018
53	ABILITY321	0.042	-0.070	-0.074	-0.165	0.108	0.153	0.165	-0.017
54	ABILITY322	-0.114	-0.001	0.183	0.049	-0.074	0.125	-0.063	0.145
55	ABILITY323	0.061	0.115	0.138	-0.003	0.049	-0.076	0.102	0.001
56	ABILITY324	0.089	0.056	0.036	0.092	0.032	0.031	-0.003	0.014
57	ABILITY325	0.058	-0.010	-0.082	0.109	0.057	0.251	0.044	0.134
58	ABILITY326	0.067	0.170	-0.000	-0.095	-0.004	0.369	0.173	-0.049
59	ABILITY327	0.103	0.025	0.076	0.007	0.072	0.270	0.225	0.132
60	ABILITY328	0.043	-0.067	-0.082	-0.029	0.169	0.206	0.214	0.169
61	ABILITY329	0.091	-0.089	-0.052	0.224	0.074	0.143	0.070	0.103
62	ABILITY330	0.114	0.051	-0.158	-0.013	0.213	0.386	0.048	0.058
63	ABILITY331	0.184	-0.082	-0.112	0.236	0.094	0.064	-0.030	-0.008
64	ABILITY332	0.085	-0.190	-0.025	0.280	0.110	0.104	-0.090	-0.238
65	ABILITY333	-0.048	0.148	0.021	0.082	0.068	-0.017	0.103	0.013
66	ABILITY334	-0.075	0.100	0.041	0.013	0.095	-0.097	0.055	0.034
67	ABILITY335	0.058	0.177	-0.114	0.104	-0.001	0.002	-0.000	0.005
68	ABILITY336	0.031	-0.056	0.486	-0.006	-0.074	0.054	-0.101	-0.122
69	ABILITY337	-0.007	0.046	0.250	-0.111	0.066	-0.098	0.202	-0.030
70	ABILITY338	0.118	-0.014	0.478	-0.062	-0.005	0.001	-0.008	0.012
71	ABILITY339	0.222	-0.030	0.386	-0.058	0.040	0.096	-0.090	0.087
72	ABILITY340	-0.000	0.187	0.266	-0.205	0.012	0.027	0.070	-0.002
73	ABILITY341	-0.011	-0.032	0.075	0.163	0.030	0.184	-0.032	0.290
74	ABILITY342	-0.122	0.133	-0.024	-0.051	-0.024	0.020	0.082	0.638
75	ABILITY343	0.059	0.126	-0.023	-0.033	-0.053	-0.078	0.051	-0.016
76	ABILITY344	0.087	0.115	0.033	0.010	0.059	0.018	0.107	0.035
77	ABILITY345	0.014	0.178	0.038	-0.020	-0.114	-0.020	-0.075	0.103
78	ABILITY346	0.037	0.075	0.105	0.088	0.064	0.070	-0.301	0.191
79	ABILITY347	0.224	-0.030	-0.133	-0.184	-0.023	0.205	-0.128	0.081
80	ABILITY348	0.261	-0.013	-0.128	-0.120	0.078	0.010	-0.002	0.439
81	ABILITY349	0.221	-0.037	-0.377	-0.019	0.013	0.081	0.009	0.127
82	ABILITY350	0.028	-0.009	-0.237	0.208	-0.010	-0.133	0.033	-0.003
83	ABILITY351	0.008	0.109	-0.117	0.040	0.160	0.027	0.046	-0.092
84	ABILITY352	0.007	0.100	0.077	-0.059	0.142	0.060	0.078	-0.027
85	ABILITY353	0.021	0.019	0.085	-0.038	-0.002	-0.008	0.110	-0.021
86	ABILITY354	0.014	0.034	0.079	0.166	0.070	-0.027	-0.086	0.049
87	ABILITY355	-0.143	-0.051	-0.026	0.287	0.074	-0.050	-0.048	0.120
88	ABILITY356	0.058	0.138	0.053	0.068	0.714	-0.014	0.033	0.085
89	ABILITY357	0.041	-0.086	-0.077	-0.052	0.596	0.010	-0.057	-0.048
90	ABILITY358	-0.018	0.101	0.019	0.127	0.072	0.084	-0.034	-0.105
91	ABILITY359	-0.160	-0.028	-0.104	0.343	0.368	0.012	0.100	-0.100
92	ABILITY360	0.003	0.105	0.020	0.624	-0.010	-0.010	-0.048	0.012
93	ABILITY361	0.042	0.059	-0.037	0.705	0.030	0.006	0.028	-0.077
94	ABILITY362	0.083	0.495	0.046	-0.009	0.011	-0.018	0.041	0.028
95	ABILITY363	0.049	0.560	0.147	0.100	0.001	0.139	0.002	0.129
96	ABILITY364	0.227	0.365	0.214	0.117	0.088	0.182	-0.007	0.024
97	ABILITY365	0.022	0.444	-0.161	0.090	0.038	0.009	-0.032	0.068
98	ABILITY366	-0.034	0.400	0.008	0.044	0.060	-0.052	-0.130	0.010
99	ABILITY367	0.027	0.131	0.114	0.049	-0.052	0.164	-0.093	-0.094
100	ABILITY368	0.036	0.416	-0.158	0.089	0.007	-0.055	0.006	0.020

ITERATIVE FA OF SUPERIOR ABILITIES

PAGE 5

VERIMAX FACTORS OF FSUP

FILE VFSUP

POSITION 17

LABEL

L17

1	ABILITY236	-0.024
2	ABILITY237	0.125
3	ABILITY238	0.054
4	ABILITY239	0.017
5	ABILITY240	-0.099
6	ABILITY241	-0.005
7	ABILITY242	-0.099
8	ABILITY243	-0.209
9	ABILITY244	-0.039
10	ABILITY245	0.025
11	ABILITY246	-0.056
12	ABILITY247	0.014
13	ABILITY248	0.071
14	ABILITY249	0.246
15	ABILITY250	0.078
16	ABILITY251	0.120
17	ABILITY252	0.080
18	ABILITY253	0.070
19	ABILITY254	0.088
20	ABILITY255	-0.035
21	ABILITY256	-0.021
22	ABILITY257	0.088
23	ABILITY258	-0.167
24	ABILITY259	0.054
25	ABILITY260	0.027
26	ABILITY261	-0.022
27	ABILITY262	0.465
28	ABILITY263	0.163
29	ABILITY264	0.001
30	ABILITY265	0.054
31	ABILITY266	-0.239
32	ABILITY267	-0.054
33	ABILITY268	-0.108
34	ABILITY269	0.068
35	ABILITY270	-0.089
36	ABILITY271	0.048
37	ABILITY305	-0.085
38	ABILITY306	-0.160
39	ABILITY307	-0.136
40	ABILITY308	-0.032
41	ABILITY309	-0.092
42	ABILITY310	0.124
43	ABILITY311	0.097
44	ABILITY312	0.054
45	ABILITY313	0.015
46	ABILITY314	0.020
47	ABILITY315	-0.083
48	ABILITY316	0.111
49	ABILITY317	-0.121
50	ABILITY318	0.014

ITERATIVE FA OF SUPERIOR ABILITIES

PAGE 6

VERIMAX FACTORS OF FSUP

FILE VFSUP

POSITION

17

LABEL

L17

51	ABILITY319	-0.175
52	ABILITY320	-0.108
53	ABILITY321	-0.101
54	ABILITY322	0.146
55	ABILITY323	0.190
56	ABILITY324	0.044
57	ABILITY325	-0.308
58	ABILITY326	-0.111
59	ABILITY327	-0.189
60	ABILITY328	0.127
61	ABILITY329	0.136
62	ABILITY330	-0.028
63	ABILITY331	-0.010
64	ABILITY332	0.098
65	ABILITY333	-0.092
66	ABILITY334	-0.090
67	ABILITY335	0.106
68	ABILITY336	0.044
69	ABILITY337	0.061
70	ABILITY338	0.073
71	ABILITY339	0.079
72	ABILITY340	-0.053
73	ABILITY341	0.007
74	ABILITY342	-0.054
75	ABILITY343	0.050
76	ABILITY344	0.045
77	ABILITY345	-0.050
78	ABILITY346	-0.032
79	ABILITY347	0.032
80	ABILITY348	0.122
81	ABILITY349	-0.019
82	ABILITY350	-0.039
83	ABILITY351	0.035
84	ABILITY352	0.057
85	ABILITY353	0.062
86	ABILITY354	0.054
87	ABILITY355	-0.053
88	ABILITY356	-0.010
89	ABILITY357	0.085
90	ABILITY358	-0.025
91	ABILITY359	-0.116
92	ABILITY360	-0.050
93	ABILITY361	0.030
94	ABILITY362	-0.018
95	ABILITY363	-0.156
96	ABILITY364	0.103
97	ABILITY365	-0.008
98	ABILITY366	-0.010
99	ABILITY367	0.125
100	ABILITY368	0.147

ITERATIVE FA OF SUPERIOR ABILITIES

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VERIMAX FACTORS OF FSUP

FILE VFSUP

POSITION		1	2	3	4	5	6	7	8
	LABEL	L1	L2	L3	L4	L5	L6	L7	L8
101	ABILITY369	0.242	-0.038	0.375	-0.024	0.001	0.197	0.040	0.701
102	ABILITY370	0.473	0.095	0.130	0.135	0.050	0.100	0.121	0.527
103	ABILITY371	0.429	-0.021	0.138	0.043	0.025	0.078	0.010	0.692
104	ABILITY372	0.310	0.077	0.240	0.152	0.068	0.144	-0.023	0.575

ITERATIVE FA OF SUPERIOR ABILITIES

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VERIMAX FACTORS OF FSUP

FILE VFSUP

POSITION		9	10	11	12	13	14	15	16
	LABEL	L9	L10	L11	L12	L13	L14	L15	L16
101	ABILITY369	0.114	0.101	-0.044	0.082	0.060	0.042	0.147	0.091
102	ABILITY370	0.018	0.260	0.005	0.022	0.076	-0.044	0.030	0.127
103	ABILITY371	0.004	0.035	0.191	0.100	-0.018	0.015	-0.032	0.039
104	ABILITY372	0.210	0.070	-0.052	-0.068	0.132	-0.017	0.025	-0.080

ITERATIVE FA OF SUPERIOR ABILITIES

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VERIMAX FACTORS OF FSUP

FILE VFSUP

POSITION		17
	LABEL	L17
101	ABILITY369	0.052
102	ABILITY370	0.021
103	ABILITY371	0.001
104	ABILITY372	-0.163